

# Computerworld Extra!

## EXTRA! EXTRA! EXTRA!

Computerworld's 109,000 subscribers will find something Extra! in their mailboxes next week: A bonus issue that will focus its entire editorial contents on a single subject, "Software in the '80s."

A highlight of the first Computerworld Extra! issue, scheduled for publication Sept. 7, is a wide-ranging interview with James Martin, considered one of the foremost authorities on the social and commercial impacts of computers. Martin discusses the chief technological forces at work in society and what they may mean for DP in the '80s.

The bonus issue represents the first time in its 13-year history that CW has added to its weekly publication schedule.

"With this special issue, Computerworld will keep its readers abreast of the fast-paced trends and developments shaping the vibrant new decade in software," according to E. Drake Lundell Jr., vice-president-editorial of CW Communications, Inc.

Extra! will also include specially prepared feature length articles by 10 experts in the software field. Among them:

- Daniel D. McCracken, consultant and former Association for Computing Machinery president. McCracken believes soft-

ware development will remain the albatross around the neck of DP executives but that new tools may transform DP from the whipping boy to the hero of the organization.

- Stephen L. Robinson, data base consultant. There will be more effective use of data base systems, Robinson predicts, but for most organizations it will be the late '80s before data base truly realizes its potential.

- Dixon R. Doll, president of the DMW Group, Inc. Structured programming techniques will become obsolete, Doll says, as alert corporations try to link users and data directly. Still missing, though, are the effective (Continued on Page 6)

# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Framingham, Mass., and additional mailing offices ©1980 by CW Communications, Inc.

Vol. XIV, No. 36

September 8, 1980

\$1.00 a copy; \$30/year

## More Than a Decade Ago

# IBM Brass Knew TNF 'Possible' Carcinogen

By E. Drake Lundell Jr.

CW Staff

ARMONK, N.Y. — Top IBM executives knew that chemicals in its copiers — and later its 3800 printers — were possibly carcinogenic more than a decade ago, although the firm did not report that fact to the Environmental Protection Agency (EPA) until this spring.

In fact, the possible carcinogenic effects of the chemicals were discussed by the firm's top management officials during the spring of 1970, when IBM was planning its first copier product.

These discussions, however, were dwarfed by management's concerns over the profitability of that product.

Both the Management Committee (MC) and the Management Review Committee (MRC) of IBM were informed of the possible carcinogenic effects of chemicals during these discussions and almost all of the present top IBM executives — including Chairman Frank T. Cary, President John R. Opel and General Counsel Nicholas deB. Katzenbach — were present for the discussions.

An IBM spokeswoman last week ad-

mitted that the firm knew that TNF was a "suspected carcinogen" in 1970, but added that "although TNF was a suspected carcinogen in animal cells, on the basis of our testing, we concluded that under the conditions in which we were using it, in the photocopying process, it did not pose a health hazard."

"Nothing in our continuing test results has altered that position," she said.

Under the Toxic Substance Control Act — passed in 1976 — companies are required to notify the EPA 90 days be-

fore they market certain chemicals.

While the original IBM copier and the 3800 printer — which uses the same drum with the suspected carcinogen — were already on the market at the time the act was passed, IBM notified the agency just this past spring that laboratory testing had revealed a possibly hazardous chemical in the 3800.

That chemical, however, was in use with IBM's first copier product and was known to its management to be a possible carcinogen when that product was introduced in 1970, according to minutes of the meetings of the two top IBM executive groups.

For example, in an MC meeting held April 1, 1970 and attended by John Opel, then a senior vice-president, among others, "the MC was informed that the photoconductor is carcinogenic," according to IBM documents introduced in the Telex vs. IBM case in

(Continued on Page 8)

## Carter Tax Credit Predicted Boon to Users

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — For computer users, the biggest single benefit of President Carter's new economic incentives program is his proposal to broaden the investment tax credit, according to Vico E. Henriques, president of the Computer and Business Equipment Manufacturers Association.

Under the present rules, Henriques explained in an interview last week, capital equipment must remain in use for seven years before the owner can deduct 10% of its cost from his tax bill. If the equipment's useful life is less, the credit declines.

The Administration now proposes to grant a 10% credit for purchase of any capital equipment used for more than one year. As a result, Henriques said, computer users will be encouraged to upgrade or replace more of their existing systems.

The investment tax credit, along with the President's other proposals, is aimed at encouraging businesses to

increase investments in new plant and equipment, create additional jobs, improve productivity and promote exports.

Other major parts of the program include an accelerated depreciation period for capital investments which will

"increase the rate of return and cash flow for firms investing in new plant and equipment"; increased income tax exemptions for Americans working in the Middle East; and a tax deduction to new businesses for startup expenses

(Continued on Page 5)

## FBA Option Announced for Intel Fast 3805

By Rita Shoor

CW Staff

PHOENIX — Fixed-block architecture (FBA) is available on the IBM plug-compatible Fast 3805 semiconductor disk from Intel Corp. through a microcode option introduced here.

Designed for installations which utilize IBM's VM operating system, the VM modifications required to facilitate the use of the Fast 3805 with what has been dubbed native mode (NM) software were developed by technicians at the University of Waterloo, Ont., Canada, the vendor said. These changes to VM also mean that IBM will no longer support the operating system, accord-

ing to Intel.

Future releases for the modified system would be supplied by the University of Waterloo, Intel added.

The NM option is said to significantly improve mainframe performance by reducing the host processor's channel-driver overhead an average of 70%. This performance improvement would apply when a Fast 3805 running with NM is compared with any device that runs with the IBM 2305 channel program, according to Herb Oberman, product manager.

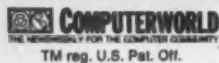
These would include IBM's 2305 fixed-head storage unit and the 4305 semiconductor disk from Storage

Technology Corp. (STC) as well as Intel's Fast 3805 minus the NM microcode, he said.

The reported performance improvement figures would seem to bear out industry speculations that FBA devices can run faster and cheaper [CW, July 14]. An FBA option has not yet been announced for either the 2305 or STC's 4305.

Utilizing FBA, the NM option partitions Fast 3805 storage into uniform blocks based on the block length specified during system initialization, a vendor spokesman explained. The blocks are addressed by a number as-

(Continued on Page 7)



Editor E. Drake Lundell Jr.

Managing Editor Nancy French

News Editor Cheryl Gelb

Senior Editors:  
 Industry Marcia Blumenthal  
 Software Marcy Rosenberg  
 Communications Brad Schultz  
 Systems Rita Shoor  
 Features John C. Whitmarsh

Senior Writer:  
 Communications Phil Hirsch

Correspondents:  
 West Coast Jeffery Beeler  
 Washington, D.C. Jake Kirchner

Writer/Analyst Marguerite Zientara

Staff Writers:  
 Tom Henkel  
 Bruce Hoard  
 Timothy J. Scannell  
 Connie Winkler

Chief Copy Editor Catherine Marengi  
 Copy Editors Steve Milmore  
 Linda Rosenthal  
 Barbara T. VanScoyoc  
 Donovan White

Photography Editor Ann Dooley

Editorial Assistant Martha Taylor

Editorial Cartoonist Jim Orton

Contributors:  
 Education J. Daniel Couger  
 Taylor Reports Alan Taylor  
 Human Connection Jack Stone

For Sales, Circulation and Production contacts, see inside back page.

Please address all correspondence to the appropriate department at 375 Cochituate Road, Rte. 30, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153

## OTHER EDITORIAL OFFICES:

West Coast: 257 Lytton Avenue, Palo Alto, California 94301. Phone: (415) 328-8064.

Washington, D.C.: 821 National Press Building, 529 14th Street N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Steve Burton, IDG Publishing Ltd., 146 Clerkenwell Road, London EC1 Phone: 01-837-1222. Telex: UK-269477.

W. Germany: Eckhard Utpadel, CW Publikationen, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 34-90-61. Telex: 5215350.

Asia: Hidetsuna Sasaki, Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: J2424461.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: SECCO AAZ5468.

Brazil: Eric Hippeau, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130638(WORD BR).

Mexico: Kevin Kellegahn, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309.

Second-class postage paid at Framingham, Mass., and additional mailing offices PN127420. Published weekly (except a single combined issue for the last week in December and the first week in January) by CW Communications/Inc. Copyright 1980 by CW Communications/Inc. All rights reserved. ISSN 127-4020. Reproduction of material appearing in *Computerworld* is forbidden without written permission. Send all requests to Marion Kibbee.

\$1.00 a copy: U.S. — \$30 a year; Canada, Central & So. America — \$50 a year; Europe and Near East — \$90 a year; other foreign — \$150 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

*Computerworld* can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 375 Cochituate Road, Framingham, MA 01701.

## Better Price/Performance

## AS/9000 Seen Besting IBM 3033

By Jeffery Beeler

CW West Coast Bureau

PALO ALTO, Calif. — A high-end mainframe that reportedly offers anywhere from 30% to 80% better price/performance than the IBM 3033 was added last week to National Advanced Systems Corp.'s (Nasc) IBM-compatible processor line.

Billed as Nasc's largest and most powerful general-purpose CPU to date, a fully configured AS/9000 provides approximately twice the performance of the 3033 uniprocessor for only about a 20% higher price, a spokesman said.

The AS/9000 reportedly also offers roughly 33% and 50% better price/performance than the 3033/AP-1 and 3033/AP-2, respectively, while consuming about a third less electrical power and occupying half the floor space.

As part of its main processing unit, the AS/9000 incorporates 16K words of reloadable control storage that allows the mainframe to be restructured as needed to accommodate additional hardware and software functions.

## Support for 3375, 3380

One of the first performance features scheduled to be added to the product during the next year to 18 months is support for IBM's recently announced models 3375 and 3380 disk systems. The 3375 will reportedly be supported in data-streaming mode, while the 3380 will transfer data to the Nasc processor at 3M byte/sec.

Another performance feature targeted soon for addition to the AS/9000 is support for both Release 1 and 2 of IBM's MVS Systems Products

(MVS/SP). Operating systems already supported by the IBM-compatible processor include MVS, VM/370 and VS/1, a Nasc spokesman explained.

Among its other main features, the AS/9000 sports emitter-coupled logic circuitry that holds 550 gate/chip and boasts 700-psec switching. The density of the machine's large-scale integrated circuitry reportedly allows the product to be cooled entirely by air and thus to dispense with complex water-chilling apparatus.

The AS/9000's introduction marks the debut of Nasc's third Advanced Systems mainframe family, which bears the same designation as the 3033-compatible processor itself. For the time being at least, the AS/9000 is the infant family's only member.

## Processor Complex

The AS/9000, though often referred to simply as a "processor," in fact consists of, not just one, but several computers that together form a "processor complex." Each of the complex's constituent parts is said to be individually microprogrammed.

In addition to the CPU itself, the complex incorporates:

- A 20-nsec arithmetic function that speeds fixed- and floating-point operations by three to fivefold.
- Two independent service processors, one for each of the AS/9000's two 20-in., four-color CRT displays.
- Up to three input/output processors.

Supplied to Nasc by the Japanese mainframe manufacturer Hitachi Ltd., the AS/9000 reportedly boasts about 67% better price/performance than the 3033 uniprocessor and provides

roughly 10% more raw computing power than a similarly configured 3033/AP-1, AP-2 or MP. In price/performance, the latest Nasc processor beats the 3033MP by approximately 80%.

One reason for the AS/9000's purported performance edge over its IBM counterparts lies in the Nasc processor's reduced machine cycle time, which has been rated at 40 nsec, compared to 57 nsec for the 3033 models.

Two other hardware features that contribute heavily to the AS/9000's reported competitive advantage include the 20-nsec arithmetic function and a 64K-byte cache buffer that uses two-way interleaving and 40-nsec bipolar random-access memory chips, the spokesman said.

In addition to 12 data channels and two I/O processors, a minimum AS/9000 configuration incorporates an 8M-byte main memory, expandable in 2M-byte increments to a maximum of 16M bytes. The processor's main storage, which offers a 320-nsec read/write cycle, uses eight-way interleaving with 16K-bit Nmos memory chips.

A maximum AS/9000 configuration with a 16M-byte main memory and 16 channels costs \$4.52 million, with optional leasing arrangements available.

First customer shipments of the AS/9000 will begin this November and coincide with the start of support for MVS/SP Release 1. The beginning of support for MVS/SP Release 2 will come next June.

More information about the AS/9000 and its accompanying support features can be obtained from Nasc at 3145 Porter Drive, Palo Alto, Calif. 94304.

## This Week

## NEWS

- Data Entry Found Averaging 9.2% Pay Boosts . . . . . 4
- Suit Filed Against Worker for Erasing Programs . . . . . 5
- Firm Advertises for Other Unhappy B800 Users . . . . . 6
- Fastest Boat, Simplest Micro Win Cup Trials . . . . . 7
- SDI Drops Rental, Requires Two-Year Lease . . . . . 8
- Climate Control Malfunction Annihilates Mice . . . . . 10
- Pioneer 4331 Installation Braves Software Snags . . . . . 11
- Group Meets to Strengthen Roll of Minorities . . . . . 12
- Boston Edison Computer Tracks Power Thieves . . . . . 13
- Computer-Generated Art Still Has a Way to Go . . . . . 14
- 'Art, But Not Great Art' . . . . . 15
- Australian Unions Condemn Technology Report . . . . . 16
- Report Outlines Four Graphics Phases . . . . . 17
- Money Fund's System Keeps Up With Cash Flow . . . . . 18
- System Books Reservations for Vacations . . . . . 20
- Envelope Design Eases Parish Donation Process . . . . . 21
- Managers on the Move . . . . . 22
- Error Correction Marks 30th Birthday . . . . . 24
- Network Keeps Landscaping Dealer Posted . . . . . 26
- Vector Graphic System B Better Than Average . . . . . 30
- Turnaround Time . . . . . 31

## EDITORIAL

- Editorial: High Expectations . . . . . 32
- Project Leaders Have 'Fear of Flying' . . . . . 33
- Making Contract Programmers 'Fit' . . . . . 33
- Taylor Report: DPMA Lacks Sophistication . . . . . 33
- Structured Coding's Twin Myths . . . . . 34
- Software Methods Need Refining . . . . . 36
- Writers Must Aim for Clarity . . . . . 38
- Human Connection: Programs Help State Aid . . . . . 40

## SOFTWARE &amp; SERVICES

- Nixdorf Launches Software Offerings . . . . . 47
- Cincom Updates Manufacturing Modules . . . . . 49
- Pascal Updated for DG Gear . . . . . 50
- 'Screen Builder' Runs on DEC VT-100 Terminal . . . . . 52
- COM Tool Frees CPUs From Converting Output . . . . . 53
- Program Implements Structured Techniques . . . . . 54

## COMMUNICATIONS

- Switched Net Cuts Footwork on Campus . . . . . 55
- Ascii POS Terminals Give Interactive Capabilities . . . . . 56
- Modem Geared to Private Lines . . . . . 58

## SYSTEM &amp; PERIPHERALS

- Determine Need for On-Line Processing . . . . . 61
- Look Again at DDP if On-Line System Needed . . . . . 62
- Disk Subsystems Emulate DEC's PDP11-C . . . . . 63
- Color Graphics Printer Has Built-In Computer . . . . . 66

## MINIWORLD

- Mini Has Hand Behind Scene at Hotel Casino . . . . . 67
- Three Sites to Host Small Computer Show . . . . . 68
- Hospital System Based on Microdata Gear . . . . . 54

## COMPUTER INDUSTRY

- Communications Mart Seen Doubling . . . . . 75
- Getting the Most From Trade Show Dollars? . . . . . 75
- Hughes Aircraft Co. Gets AT&T Satellite Contract . . . . . 76
- France Leading Services Supplier in Europe . . . . . 81
- Exxon Expected to Make It Big in Information . . . . . 83
- Software Tax Proposal Blasted in Bay State . . . . . 84



# Robin Hood

**High Sheriff of Armonk accuses SyncSort OS of "taking from rich, giving to poor!"**

**Call (201) 568-9700.**

**Get your share of the wealth.**

#### OVERSEAS REPRESENTATIVES—

Düsseldorf: SyncSort Technology GmbH,  
Tel.: 0211-480351  
Johannesburg: Computing Benefits Ltd., 46-2083  
Melbourne: Shell Co. of Australia Ltd., (03) 8400311  
Milan: SYNTAX, (39-2) 87. 74. 44  
Paris: CAP/SOGETI Produits, 33-1-539-22-25  
Reading (UK): SyncSort Technology Ltd.,  
44-0734-481919  
Stockholm: BRA, 46 8 88 03 00  
Tel Aviv: ADVANCED TECHNOLOGY Ltd., 442697  
Tokyo: Software Engineering Co., Ltd., (03) 446 1811  
Utrecht: SyncSort Technology BV, 030-31-26-11



**COMPUTER SYSTEMS Inc.** 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

#### NEWS REPORT

In a crowded press conference, the High Sheriff of Armonk today charged that a sort program is "taking resources from rich computer systems and giving them to poor OS/VS users throughout the Realm."

Speaking to reporters at his heavily fortified castle, the Sheriff, Sir Basil Bathrobe, said: "Frankly we think it's time somebody blew the whistle on this Robin SyncSort fellow and his so-called Merry Band."

"These varlets cause trouble every time we send an expensive system through Whitlow Forest. First they capture it, then they use software black magic to extract more sorting work for fewer resources."

**"And the worst part is that they pass these savings along freely to thousands of SyncSort users. As a result 62% of the nation's OS/VS users are saving anywhere from 15% to 50% on the amount of CPU Time, Elapsed and SIOs they use. They're simply evading their sorting taxes," the Sheriff said.**

"King John has authorized me to say that he views this situation with great alarm. He hasn't been so upset by anything since Magna Carta!"

Gee, we'd like to thank Sir Basil for his kind words about SyncSort's performance. But we wish he'd mentioned that we have a couple of other strings in our long bow:

**LIBERATING PROGRAMMERS.** To make life a little easier for stout-hearted applications programmers, SyncSort OS includes a whole quiver full of sharp labor-saving features:

- INCLUDE/OMIT — chooses records to be sorted;
- SUM — summarizes designated numeric fields;
- INREC/OUTREC — reformats records on input and output;
- MAXSORT — greatly reduces disk-space requirements on large sorts, and improves BREAKPOINT/RESTART capability.
- BETTERGENER — provides outstanding resource savings on most straight-copy tasks when compared to IBM's IEBGENER.

**RESCUING MAIDENS:** We're particularly proud that the SyncSort band includes some of the best customer-service types in the business. If you encounter any sorting question, send up a signal. We'll notch up an arrow and shoot you back an answer fast. About 80% of all service requests are resolved within 24 hours.

**SO JOIN OUR MERRY BAND.** Put on our distinctive money-green suit and come out into Whitlow Forest. Find out that sorting can be fun. Give us a call. Ask for Maid Marian, Friar Tuck or Little John.

# Data Entry Found Averaging 9.2% Pay Boosts

By Rita Shoor

CW Staff

WILLOW GROVE, Pa. — Data entry operators averaged pay boosts between 8.2% and 9.2% compared to an overall average of 7% for DP personnel in general, according to a survey by the Administrative Management Society (AMS) here.

As of Feb. 1, the weekly salary for lower level ("B" classification) key-

punch operators was \$184 in the U.S., and operators classified as "A" (higher level) received \$205 per week, the survey found. These figures represented respective increases of 8.2% and 8.5% over 1979 salaries for the same jobs, AMS said.

While CRT terminal operators received a lower weekly salary (\$189) than the A-level keypunch operators, the annual increase of 9.2% was

greater, according to the report.

The U.S. weekly salary for the eight DP positions included in the survey was \$260, AMS said. This reflected an overall average increase of 7% over the \$243 weekly salary for the same group one year earlier, the firm pointed out.

Among the employment classifications included in the DP portion of AMS' report were computer operators, programmers, programmer/analysts and systems analysts. The 34th annual survey, published in 1980-81 AMS Office Salaries Directory, also covered 12 clerical positions and included some 543,446 employees in 6,613 companies from 134 U.S. and Canadian cities.

Keypunch operators in Canada also realized wage increases higher than the average 10.3% increase for 1980, according to the survey. Based on the AMS figures, A and B-level operators increased their weekly salaries by 12% and 14.4%, respectively. However, Canadian CRT terminal operators' weekly increases kept pace with the average DP increase of 10.3%.

central, southern and western regions. Both classifications of keypunch operator received the highest weekly salary in the east central region, based on the report. However, CRT terminal operators in the western region took home the highest paychecks in their job classification, AMS said.

## Manufacturing Pays Most

Based upon breakdowns for U.S. keypunch and CRT terminal operators according to type of business, the manufacturing/processing area pays the highest average salary, the professional management association noted. The average weekly salary for A-level keypunch operators was \$224 with CRT terminal operators and lower level keypunch operators receiving \$210 and \$201 per week, according to the respondents.

The four additional categories included in this portion of the AMS survey were banking/insurance/financial, retail/wholesale sales and distribution, government agencies and an "all other" category including utilities, educational and medical institutions and employment firms.

Regional and business breakdowns are not available for Canada, AMS explained, because of a smaller sample size and the fact that only 12 of the 134 participating cities are in Canada.

In addition to salary figures, the survey includes such fringe benefit data as length of work week, paid holidays, overtime, unionization and vacations for respondents from U.S. and Canadian firms, AMS said.

Copies of the report may be obtained for \$75 by writing to the Administrative Management Society, Maryland Road, Willow Grove, Pa. 19090.

## Low End

Despite the percentage figures, data entry operators are still on the low end when compared to the salaries received in other DP-related positions, AMS said.

In the U.S., salaries for the eight DP positions range from \$184 per week for lower level keypunch operators to \$417 per week for systems analysts. Canadian systems analysts top the surveyed group with weekly salaries of \$440 in Canadian dollars compared with \$213 received by CRT terminal operators, AMS noted.

The survey also identified salary averages on a regional basis by dividing the U.S. into eastern, east central, west

Average Weekly Salaries for Keypunch and CRT Operators

| Position            | U.S.  |       |                  | Canada |        |                  |
|---------------------|-------|-------|------------------|--------|--------|------------------|
|                     | 1979  | 1980  | Percent Increase | 1979   | 1980   | Percent Increase |
| Keypunch Operator A | \$189 | \$205 | 8.5%             | C\$216 | C\$242 | 12.0%            |
| Keypunch Operator B | \$170 | \$184 | 8.2%             | C\$194 | C\$222 | 14.4%            |
| CRT Operator        | \$173 | \$189 | 9.2%             | C\$193 | C\$213 | 10.3%            |

U.S. Weekly Averages — 1980 by Region

| Region       | Keypunch Operator A | Keypunch Operator B | CRT Operator |
|--------------|---------------------|---------------------|--------------|
| Eastern      | \$208               | \$185               | \$186        |
| East Central | \$213               | \$193               | \$187        |
| West Central | \$204               | \$180               | \$181        |
| Southern     | \$190               | \$175               | \$186        |
| Western      | \$210               | \$185               | \$208        |

U.S. Weekly Averages — 1980 by Type of Business\*

| Type of Business                      | Keypunch Operator A | Keypunch Operator B | CRT Operator |
|---------------------------------------|---------------------|---------------------|--------------|
| Manufacturing/Processing              | \$224               | \$201               | \$210        |
| Banking/Insurance/Financial           | \$187               | \$165               | \$172        |
| Retail/Wholesale Sales & Distribution | \$203               | \$180               | \$178        |
| Government Agencies                   | \$194               | \$180               | \$197        |
| All Others*                           | \$211               | \$194               | \$197        |

\*This category includes utilities, educational, medical and employment.

Charts Courtesy of AMS

## DEC Adds 1.2G-Byte Store For Decsystem-10 and 20

MAYNARD, Mass. — Digital Equipment Corp. last week announced a dual-module disk storage unit for its Decsystem-10 and Decsystem-20 mainframe computer systems, offering 1.2G bytes of unformatted storage space.

At the same time, the company announced reduced memory prices for the Decsystem-20 and its Decsystem-1091, and enhancements to the firm's Tops-10 and Tops-20 operating systems to accommodate the new disk drive.

The RP20 disk drive is currently the highest capacity disk offered by DEC. Each unit consists of two data modules, each providing more than 469M bytes of formatted disk storage. In addition, each module has 15 recording surfaces with two read/write heads per surface and a transfer rate of 1.2M byte/sec, a spokesman claimed. The dual port option is said to allow each data module to transfer data independently.

DEC is also incorporating the RP20 disk drive into a disk subsystem called the RTP20. Up to four RP20 disk drives can be included on the RTP20's controller. A total of six RTP20 subsystems can be attached to Decsystem-10 and Decsystem-20 mainframes, for a total of more than

22G bytes of formatted storage, the spokesman said.

Software enhancements in the Tops-10 and Tops-20 operating systems fully support the RTP20 disk storage subsystem, DEC said. Through the operating system enhancements, the RP20 disk can also be used with the Decsystem-1090, dual -1090 and -1091 computers and Decsystem-2040, -2050 and -2060 configurations.

Finally, DEC has reduced memory prices for the Decsystem-20 and Decsystem-1091 mainframes. The MF20 memory, which was previously priced at more than \$56,000 per 256K-byte expansion unit, now costs \$42,000.

The high-capacity disk introduction and lower memory cost are both aimed at improving the whole system cost of the Decsystem mainframe, according to Joseph Biula, DEC's Large Systems Product Manager.

The RTP20 subsystem with one RP20 disk unit costs \$140,000. Additional RP20 disk units are priced at \$49,000.

There is no charge for enhancements to already installed Tops-10 and Tops-20 operating systems, the spokesman noted from 146 Main St., Maynard, Mass. 01754.

# CICS/VS

## COMMAND LEVEL PROGRAMMING COURSE

September 22-29, 1980 • 9 AM to 5 PM

This course is intended for application programmers destined to develop application programs under CICS/VS using the command level interface.

- Develop and maintain CICS/VS command-level application programs.
- Determine the trade-offs for the best use of the various CICS/VS facilities.
- Make use of the basic input/output facilities of BMS as they relate to the IBM 3270 IDS or 3270 compatible terminals.

Call COLLECT or write for complete information:

**CompEd**  
(212) 921-8676  
1133 Ave. of the Americas, New York, N.Y. 10036  
A subsidiary of Spinnaker & Associates, Inc.  
\*Early registration recommended.  
Courses based upon Monday-Friday schedule.

yes, Please send more information & registration forms.

Name \_\_\_\_\_

Co. Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_



# Within Hours of Firing Suit Filed Against Worker for Erasing Programs

By Tim Scannell  
CW Staff

NORRISTOWN, Pa. — An electrical instrument manufacturer here has filed suit against a former employee who allegedly destroyed a number of critical computer programs within hours after being fired.

Joseph Hershman, a project manager and programmer while at the company, allegedly used a remote terminal to tap into the firm's IBM 370/158 Model 3 computer system and erased programming related to one of the company's latest products — a microprocessor-based control system.

Using a password assigned to him by Leeds & Northrup, the former employee allegedly gained entry into the computer shortly after midnight on June 5. He then allegedly spent nearly 12 minutes on the system, wiping out programs needed by the firm for its Max-1 control system product, the suit claimed.

In the suit, filed in Montgomery County Court, Leeds & Northrup originally sought "not more than \$10,000" in damages, plus a court order restraining Hershman from tampering with the computer in the future, Theodore J. Swift, a spokesman for the firm, said. However, last week, Hershman's lawyer, replying to the suit, reportedly met with the company's lawyers and reached an agreement "which did not involve dollars." Terms of that agreement and a possible out-of-court settlement could not be released at this time, Swift maintained.

Leeds & Northrup personnel discovered Hershman's alleged unauthorized entry into the computer when later

that same day they tried to erase the ex-employee's password key and found that data was missing. Any information pertaining to Hershman and the work that he did on the Max-1 microprocessor control system while at the company had been wiped out, Swift explained.

Leeds & Northrup routinely changes passwords every four to six weeks and blocks out a password when an employee leaves or is let go, he added.

Checking the computer's log, which keeps an ongoing record of the hour, minute and second of anyone who accesses the system's files, Leeds & Northrup people learned that Hershman had entered the system at

about 12:48 a.m. on June 5 and used the computer for 11 minutes and 39 seconds, presumably the time it took to erase the needed computer programs.

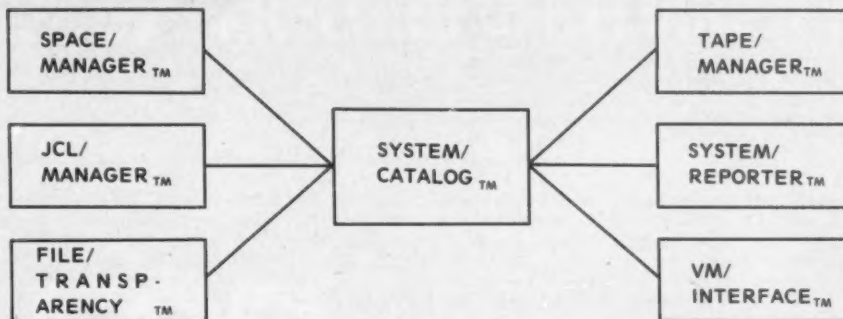
Fortunately, the instrumentation manufacturer was able to immediately restore the obliterated programs from a set of backup magnetic tapes. The tapes are periodically created from information on the system's disk files and serve as a hedge against natural disaster or incidents of deliberate computer sabotage. It is not known whether Hershman was aware of the existence of the backup tapes, Swift said. However, the Max-1 project would have been seriously jeopardized

if the erased programs were not able to be restored.

Basically, Leeds & Northrup filed suit to find out exactly how much damage Hershman did to the computer's files and whether that destruction ranged beyond the project he was working on at the time of his employment, Swift noted. The "not more than \$10,000" in damages asked for in the suit is roughly what it would cost in man-hours to search through all of the computer's disk files for additional sabotage.

The company also filed suit to make the issue public and possibly deter any future deliberate acts of sabotage by disgruntled present or past employees.

## FRUSTRATED WITH DOS/VS(E)?



## The System/Manager™ is the Solution! ©

SYSTEM/MANAGER is the only fully integrated DOS/VS(E) Resource Management system with a single catalog and associated utilities for both disk & tape data set management. By automating resource management, SYSTEM/MANAGER allows your operations personnel to run your system at maximum capacity with far fewer errors. By simplifying and expanding DOS/VS(E) JCL, SYSTEM/MANAGER increases programmer/operator productivity. And, as an added bonus, it reduces your disk space and tape requirements. Thus SYSTEM/MANAGER relieves operational frustrations, saves personnel & computer time, reduces costs, and generally improves your D.P. environment. To learn how, call or write us today.

I'd like to learn more -- ☐ Please Call ☐ Please Send Details on how System/Manager can help us.

Name \_\_\_\_\_  
 Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 Street \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone: A/C ( ) No. \_\_\_\_\_  
 Hardware \_\_\_\_\_  
 Operating System \_\_\_\_\_  
 S/M 150.0



**INSAC**

ALTERGO SOFTWARE INC.

1000 Iris Drive  
 Conyers, Ga. 30207 (404) 922-7235

## Tax Credit Seen Boon to Users

(Continued from Page 1)

that are presently nondeductible:

Additional features include regulatory reform, specifically including continued support for pending legislation which would replace the Communications Act of 1934; additional federal support for research and development, particularly in high-technology fields; establishment of a high-level "Economic Revitalization Board" to "promote government and private sector cooperation in dealing with the complex issues of industrial policy," expanded funding for new transportation facilities and energy conservation; and special tax measures designed to stimulate industrial development in economically depressed areas.

The big question at the moment is how much of this program will get through Congress, which will begin considering it early next year. Substantial changes are likely.

There is widespread opposition to one feature of the investment tax credit proposal which would pay a cash rebate to a firm that wasn't profitable enough to use the credit. Opposition is based on the argument that if the rebate is allowed, much of the money will go to "distressed" industries — like the automobile industry — that will remain distressed for other reasons.

## Gets 300 Responses Firm Advertises for Other Unhappy B800 Users

By Tim Scannell  
CW Staff

NORTHBROOK, Ill. — "Attention: Unhappy users of Burroughs B800 and similar Burroughs computer hardware and software..."

That is how an ad placed recently in *The Wall Street Journal* began. The ad was authored by a dissatisfied Burroughs Corp. customer — Quality Books, Inc., a publisher and book wholesaler here. The firm was preparing to sue Burroughs for faulty computer equipment and wanted to hear from other firms that may have been the victim of "overly zealous computer salespeople [that] may have misrepresented the Burroughs B800."

To date, the unconventional ad has drawn more than 300 replies from B800 or B900 users across the country, according to Tony Leisner, general manager at Quality Books. "It became pretty obvious that we were not the only ones whose system didn't work," he said, noting that there were already a number of active lawsuits concerning the B800 minicomputer.

A Burroughs spokesman at the company's corporate headquarters said he was not aware of the problem or the ad.

### Unused System

About two years ago, Quality Books, which sells material to schools and libraries, purchased a Burroughs B800 computer system to help with its order entry and accounts receivable. The system has 128K bytes of memory, two terminals and a printer. However, since its installation the computer has reportedly never worked.

In fact, for the past six to eight months, the machine has been unplugged and wrapped and sits in a corner of the Quality Books building, Leisner explained. The company's business chores are presently conducted through a service bureau.

When the Northbrook company first

had difficulties with the newly delivered B800, officials there complained to Burroughs service personnel who promptly told them that they "were the only ones having problems, everybody else's B900s were working fine," Leisner related. But, after running the ad in the midwestern edition of *The Wall Street Journal*, which drew 50 to

60 responses, and later in the national issue, the company knew that its problems were not particular to its system.

During the past few weeks, Burroughs representatives and the firm's attorneys have had at least one "sit-down session" to discuss Quality Books' problems with its B800. Leisner declined to discuss just what problems

are involved with the system because of the "sensitive position" of present negotiations. However, thus far "nothing definite has been set one way or another," he pointed out.

"We have a suit prepared but have not filed it... pending the opportunity to sit down and talk turkey with Burroughs," Leisner commented.

## Analysis Predicted Win for Miss Kansas

DE KALB, Ill. — If Professor George L. Miller's method of statistical analysis is as accurate this year as it was last year in predicting who would win the Miss America contest, Leann Folsom of Kansas now wears the crown.

Miller, a Northern Illinois University professor of business systems and analysis, accurately predicted in 1979 that Miss Mississippi, Cheryl Prewitt, would win the title, with odds of 9 to 2 [CW, Oct. 1, 1979].

The predictions — which last year caused quite a flap among fellow statisticians and pageant officials — are based on computer analyses of 13 variables that contribute to each candidate's composite statistical profile, according to Miller.

Folsom's profile indicated highly probable success based on choices made by past pageant judges. In fact, Miller listed odds of 2 to 1 that Miss Kansas would be the next Miss America, far better than the odds he gave to last year's winner.

Miller pointed out that his predictive model, which he has refined over the past year, "is set to be right about one out of four times on the basis of information available on the day of the finals."

Applying his model to past pageants, Miller said that if he used just pageant data as in the case of Miss Kansas, the model would have been on target for four of the last 17 years. Using information available on the days of



Miss America?

the finals, the model would have accurately predicted a winner eight of 17 times.

Miller also pointed out that Miss

America contestants can walk into the competition with a number of strikes against them, according to his analysis of past contestants and winners.

For example, a winner's ancestry usually does not go back to southern or southeastern Europe; judges seem to prefer western or northern European backgrounds. Furthermore, a contestant who twirls a baton, tells jokes, dances or comes from a large city probably will not win either, according to Miller's analyses.

Asked if judges might be influenced to vote for or against Folsom because of Miller's prediction, Miller pointed out that the effect could be positive or negative depending on the individual judge.

The data was processed — last year on IBM 360/67 and 370/148 mainframes and this year on an Amdahl Corp. 470V/7A computer — using the Statistical Analysis System (SAS) software from SAS Institute, Inc. of Raleigh, N.C.

## Former Exxon Manager Arrested for Alleged Deal

By Marguerite Zientara  
CW Staff

PHILADELPHIA — A former Exxon Corp. employee who allegedly tried to sell to IBM detailed plans for Exxon's as yet unreleased Hornet line of information processing products was arrested recently by a Federal Bureau of Investigation agent posing as a representative of IBM.

Orion N. Briel, until recently a manager of marketing publications for QYX, the Exxon division developing the Hornet system, has been charged with mail fraud in offering the plans to IBM by mail, according to U.S. Attorney Peter Vaira.

Briel resigned from QYX on Aug. 13. The next day, he allegedly mailed a certified letter to Dan McGlaughlin, vice-president of marketing for IBM's Franklin Lakes, N.J., office, offering the plans, according to Vaira and U.S. District Court documents.

McGlaughlin immediately contacted Exxon and Exxon then contacted the FBI, Vaira said. On Aug. 22, according to the documents, McGlaughlin telephoned Briel, who allegedly repeated his offer to negotiate the transaction.

Five days later, on Aug. 27, the FBI agent and Exxon engineer Jack Atkin, both posing as IBM representatives, met Briel at the Holiday Inn in King of Prussia, Pa., near the Pennsylvania Turnpike.

Briel allegedly presented the two men with detailed plans and specifications for the Hornet product line, as well as

for other products, and offered to sell the information for \$100,000.

Atkin told federal agents the plans "were very detailed" and had the "potential to badly hurt" Exxon, according to Vaira. The plans, which Atkin called bona fide information, had been previously reported missing from a desk and cabinet at QYX headquarters in Lionville, Pa., by an Exxon security official.

Briel was arraigned in U.S. District Court here and released on \$3,000 bail. He "most likely will be indicted" within two weeks, Vaira said. By law, a trial date must be set within 60 days of an indictment, he added.

Neither QYX's spokesman on the matter nor Briel was available for comment.

## 'Extra' to Focus On Software

(Continued from Page 1)  
tive pathways between the two.

• Ronald G. Ross, editor of "Data Base Newsletter." Data management will rise to the fore in the '80s, according to Ross. In an excerpt from his forthcoming book, Ross tracks the expanding role of data dictionaries.

• Herbert L. Gepner, group managing editor/software at Datapro Research Corp. Gepner describes the exploding demand for off-the-shelf application packages.

### THE KEY TO PROJECT MANAGEMENT

# PAC I

International Systems PAC I™ is an invaluable automated project scheduling and cost control system. This extremely versatile CPM computer software package can help you direct and track networks from a wide variety of multi-task projects.

With PAC I, you can analyze resources and the effect of manipulating them. You can monitor progress and costs. You can use either I, J or precedence notation.

You can locate and solve potential problems. And you can update schedules easily and quickly.

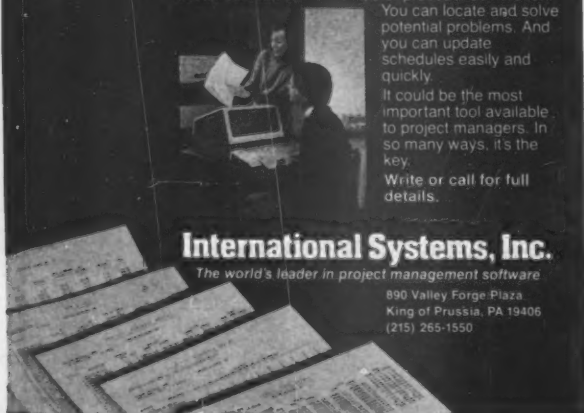
It could be the most important tool available to project managers. In so many ways, it's the key.

Write or call for full details.

## International Systems, Inc.

The world's leader in project management software

890 Valley Forge Plaza  
King of Prussia, PA 19406  
(215) 265-1550





# Fastest Boat, Simplest Micro Win Cup Trials

By Tim Scannell

CW Staff

NEWPORT, R.I. — After battling for nearly two weeks in the sometimes

## IBM Price Cuts May Mean More

WHITE PLAINS, N.Y. — The IBM Data Processing Division has cut purchase prices for its 3211 printer and 3811 controller. The 3211 Model 1 dropped from \$53,440 to \$40,080 and the 3811 Model 1 was reduced from \$23,580 to \$17,685, effective Aug. 22.

However, maintenance charges for the 3211 were increased by 10% to \$740 a month. Balancing that was a 20% maintenance decrease for the 3811, to \$158 a month.

Industry experts feel the purchase price decreases are a precursor to the introduction of a new printer model and speculated IBM may be coming out with a faster — up to 3,000 line/min — model to replace the 2,000 line/min 3211. The 3211 is currently the firm's fastest impact line printer. In some configurations, it can operate at up to 2,500 line/min.

Introduced along with the 370 mainframe in June 1970, the original price tag on the 3211 was \$129,150. Prior to these cost reductions, the most recent price alteration was a blanket 5% increase for purchase, rental and lease prices last Dec. 28.

## Intel Debuts FBA Option

(Continued from Page 1)

signed to a given range of blocks. Then, data transfer into the storage blocks is started with two channel commands.

When operating in native mode, the Fast 3805 also utilizes all of the storage capacity available with no loss from the inter-record gaps found on rotating disks, Intel said. This capability is said to increase usable disk storage in some installations by 30% or more.

The Fast 3805 semiconductor disk runs in emulation of an IBM 2305 disk with IBM's 2835 controller, Oberman said. Since two Fast 3805 controllers can be contained in a single box, it will be possible for the single unit to have one Fast 3805 emulating the 2305 and the second controller operating under native mode.

The Fast 3805 for which the NM option was designed utilizes random-access memory to provide a storage capacity from 12M- to 72M bytes, Intel said. The standard data transfer rate is 1.5M- to 2M byte/sec depending upon CPU channel characteristics.

Available in late 1980 both as an upgrade for current Fast 3805 users and as an option to be considered by potential Fast 3805 customers, the NM software including the VM modifications leases for \$350/mo, Intel said.

A typical Fast 3805 configuration of one controller with 12M bytes of storage is priced at \$4,870/mo on a 36-month lease and can be purchased for \$158,000. Intel's Commercial Systems Division is at 12675 Research Blvd., P.O. Box 9968, Austin, Texas 78766.

stormy waters of Rhode Island Sound, victory in the recent America's Cup trials went to the fastest boat — not to the one with the more sophisticated computer system.

The 12-meter yacht Freedom and its onboard Hewlett-Packard Co. 9825 microcomputer beat the two other American contenders, Clipper and Courageous, following a series of elimination races. Freedom will defend the U.S. against the Australia, winner of the challenger's spot, when the America's Cup races begin Sept. 16.

During the American elimination trials, Clipper's navigation system relied on a Data General Corp. MP/100 microprocessor aboard the 12-meter yacht and a DG 4/X minicomputer located on shore [CW, Aug. 18]. The

seagoing micro was linked to nearly every marine instrument on the yacht and recorded such factors as apparent wind speed, boat speed and the direction the yacht was sailing.

Clipper's microcomputer continually transmitted data back to the 4/X via a specially modified Avanti Communications Corp. modem.

### Courageous' Micro

Contrary to previous reports, the crew of the Courageous also used an onboard computer to monitor the effects of wind and wave on the sleek yacht. A Digital Equipment Corp. LSI-11 microprocessor was used throughout the rigorous trials and incorporated a number of recently developed programs that reportedly aided

skipper Ted Turner in the competition.

Data monitored by the shipboard micro could also be selectively recorded by Courageous' navigator, Bill Jorch, who, when he is not sailing, is a computer programmer and engineer at Grumman Aerospace Corp. Unlike the massive amounts of data continuously recorded by Clipper's MP/100 computer and 4/X minicomputer, Courageous' micro recorded nautical information at the push of a button.

Once ashore, Jorch or Turner could review the data on a DEC VT-103 terminal, transfer it to disk or produce hard copy for later analysis.

It is not known if the Australian crew will be using a computer to navigate during the week's races.

## PROVEN RECORD OF RELIABILITY

# FDR™

## FAST DUMP RESTORE

### FAST DUMP RESTORE

FDR with over 3400 users and, nominated to the DATAPRO HONOR ROLL for the 6th consecutive year, has a proven record of RELIABILITY and EFFICIENCY. FDR permits the user more opportunity to back up his files while using significantly less CPU and elapsed time.

### COMPAKTOR

A disk management utility which reorganizes disks at FDR speed. COMPAKTOR permits the user to easily position and sequence data sets. Multi-extent data sets are changed to single-extent data sets and the user is also allowed to change both the size and location of a volume's VTOC.

Available for IBM OS, VS and MVS.

For Further Information  
or Free 30 Day Trial, Call or Write...



**INNOVATION**  
DATA PROCESSING

970 Clifton Avenue, Clifton, NJ 07013 • 201-777-1940

# SDI Drops Rental, Requires Two-Year Lease

By Marcy Rosenberg

CW Staff

SAN MATEO, Calif. — Users of SDI, Inc.'s system software will no longer have the option of renting these products on a month-by-month basis. Instead, they will be required to commit to two-year leases by Sept. 21 or the products will expire.

Previously, users had the choice of either renting month by month or leasing at the same monthly rate for a two-year term.

An SDI spokesman said its new policy applies to all products: Grasp, Grasp/VS, Dox, Epat, Fleet and Fleet Online, Reach and Fasttp. Monthly charges under two-year lease contracts signed by Sept. 21 will remain the same as current per-month fees.

Citing a general rise in the cost of doing business, the spokesman called SDI's two-year lease requirement "a decision made in lieu of having to raise prices. We're seeking longer term commitments rather than raising prices."

SDI notified customers of its policy change by registered letters mailed Aug. 15, giving them about 30 days to decide whether to go with the two-year lease plan.

## Users Object

Although given the 30 days' notice required under contract, a number of SDI users voiced objections to the new policy. "A \$50,000 commitment over two years is not something we want to do," stated the director of computer operations at a New York City publishing firm that has rented Grasp/VS on a month-by-month basis since 1973.

As a result, this user is weighing whether to convert to Power/VS from IBM, an effort it estimated would normally take three months to complete. "Unless we can get a stay of SDI's decision, we'll have no choice but to put in more than 100 hours of in-house staff overtime plus at least 60 to 80 hours of consultant time" to convert by Sept. 21, the computer operations

director said. The cost to his firm: "Approximately \$5,000 to \$6,000."

Nevertheless, he feels the conversion effort is worth it for his department — a DOS/VS shop running one 768K-byte and one 384K-byte IBM 370/145 — because Power/VS provides certain features for on-line systems and programming development that Grasp/VS doesn't offer. For example, his shop uses IBM's Entry Time Sharing System/II (ETTS/II) and "ETTS

printed output cannot be retrieved at a terminal using Grasp/VS."

Cost savings was also one of the reasons another Grasp/VS user, St. Luke's Hospital, New York, decided to switch to Power. Admitting that the department was planning not to renew with SDI anyway, systems and programming manager Carol Pulaski noted that Grasp/VS — which her installation has been renting for the past seven years — "was costing us \$1,300

to \$1,400 per month."

She was quick to add, however, that her department has received "excellent" service from SDI and that an advantage of Grasp/VS is that it will start printing output before a job is finished, "saving some time" over Power, which will wait until a job is completed before printing unless the job is segmented. Pulaski's shop runs one 512K-byte 370/148 under DOS/VS.

# IBM Knew TNF 'Possible' Carcinogen

(Continued from Page 1)

1972.

At the time, the MC was discussing possible problems with launching the firm's planned copier product. The firm had planned to inform production line workers that the product contained dangerous chemicals, but "the MC was dissatisfied with the manner in which we planned to notify employees of this fact," according to the minutes.

The MC was not worried about users, however, since it felt that they would have no contact with the carcinogenic substances even though it now says that trace amounts might be transmitted to people operating the 3800 printer, which uses the same chemical.

In a meeting just the next day of the MRC — the highest management group in IBM at the time — that body received a report listing four drawbacks of the system including "potential medical exposures to chemicals on the drums."

That meeting was attended by T.J. Watson Jr., the chairman of the board, T.V. Learson, presently a board member and then president, and F.T. Cary, then one of five senior vice-presidents. While the possible medical problems for employees was one of the issues, a higher priority problem was the "financial outlook" for the project, the minutes indicated.

The Management Committee met again the next day to discuss "the proposed methods of handling the health and safety problems associated with the copier." The MC agreed with an unidentified proposal for handling informing the employees, although it apparently did not mention the possible carcinogenic effects of the chemicals used.

According to the minutes, "The MC agreed [with the methods to handle the problems] although Marshall indicated that he would be inclined to use the word cancer if appropriate."

Burke Marshall, a former U.S. Attorney General, was at that time a senior vice-president at IBM, and resigned just 10 days after the incident, although there is nothing in the minutes to indicate why he resigned.

## Tests Reviewed

Another mention of the chemicals comes in a presentation before the Management Review Committee on April 7, 1970, where it is noted that an IBMer "reviewed the history of the medical tests made on the drum material which had the potential for carcinogenic reaction. It was agreed that the exposures here were minimal."

The rest of the meeting — attended by Opel, then a senior vice-president, Cary, Watson, Learson and Katzenbach, among others — was spent reviewing the "market potential" for the

copier program. Almost 10 times as much space in the minutes is devoted to profits and marketing as is to the health problems.

## Confirmed Carcinogen

The chemical in question is Trinitrofluorone (TNF) which was confirmed to be a carcinogen by the EPA in mid-August.

The chemical was used in the first IBM copiers, the Model 6800, introduced in 1970. Later IBM incorporated the same drum into its 3800 laser printing system, which was introduced in 1975.

In May of this year, IBM reported to the EPA that it had discovered that TNF might be a carcinogen and reported that fact to the EPA [CW, June 9]. The EPA confirmed that fact in August [CW, Aug. 25].

TNF is known to induce gene mutations in bacterial and animal cells in laboratory experiments, based on IBM data, EPA said, but whether it is harmful to humans is still unknown, according to the EPA's preliminary evaluation.

IBM has claimed all along that there is no danger from the chemical to users of the 3800. IBM notified users about the existence of the chemical in the printer's photoconductor process, but assured users that there is no health hazard involved.

TNF, according to IBM, may come into contact with the printer's toner, which is subsequently deposited on the printed page. Trace amounts of the chemical may remain on the output copy and might from there be transmitted to persons operating or servicing the machines.

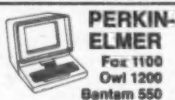
## Additional Data

IBM maintains that the amount — estimated at a maximum of three micrograms per page — would be too small to pose any health risk to humans. Presently the EPA is waiting for additional data from IBM before making recommendations on the chemical's continued use.

The data requested includes how much TNF is found in the air around the operating printer, how much of the chemical remains on the paper with the toner, whether TNF reacts with other chemicals and what happens to the spent toner after it is removed from the photoconductor.

This information will help to "better determine the nature and the extent of any possible risks of injury to human health due to exposure to TNF," the EPA stated.

For now, however, the EPA has not suggested that people refrain from using the equipment. IBM has said it will cooperate fully with the EPA.



PERKIN-ELMER  
Fox 1100  
Owl 1200  
Bantam 550



DIABLO  
Diablo  
1640/50



RACAL-VADIC  
All Models

# Terminals NOW!

## 3 Month Lease or Immediate Sale



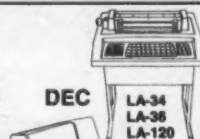
Your single source for brand-name terminals.

# QWIKTERM

East: (617) 246-1665

West: (415) 461-0923

P.O. Box 185, Lynnfield, MA 01940  
1100 Larkspur Landing Cir., Larkspur, CA 94099



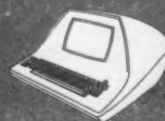
DEC  
LA-34  
LA-36  
LA-120



VT-100  
VT-52



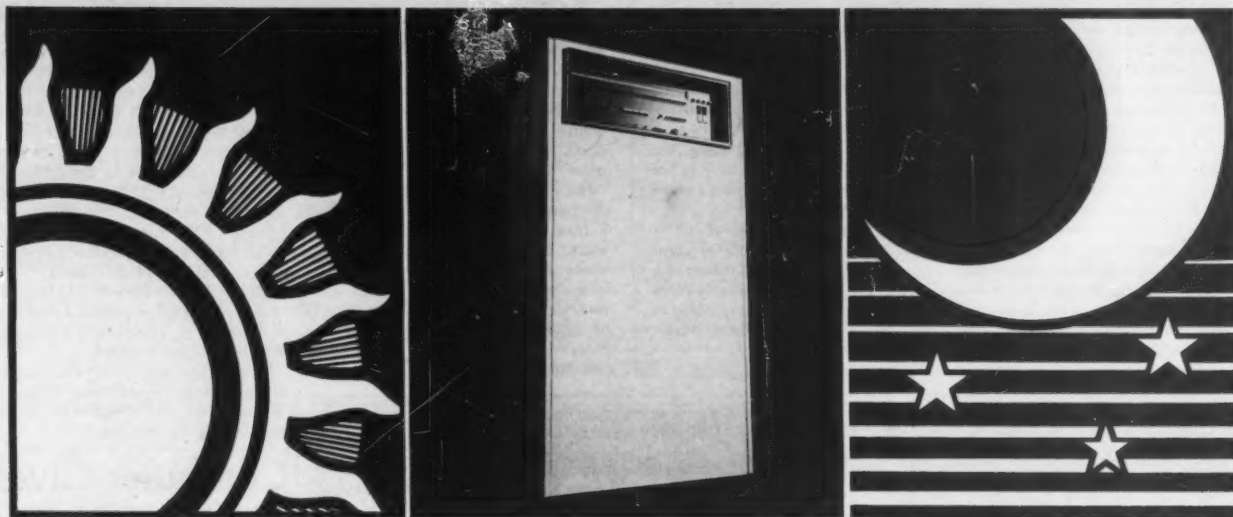
TI  
TI-745  
TI-765  
TI-820



ADM-3A  
ADM-31  
ADM-42



# There are some things in life



## you can always rely on.

The sun will set. The moon will rise. You can take them for granted. They're dependable. They're consistent. They work. Just like the 1270 Terminal Control Unit from Memorex. There are literally thousands of 1270s functioning worldwide, some for up to seven years without a single service call.

If you think only IBM can make a reliable controller, you haven't heard everything about the Memorex 1270 Model 8. Whether you're starting a system or adding to one already up and running, **the Memorex 1270 Model 8 offers you a total control solution:**

It attaches directly to your System/360, System/370, 303X, 43XX or compatible byte multiplexer channel.

It's the functional replacement for your 270X transmission control units, your 3704 or 3705 communications controllers in the 270X emulation mode and integrated communications adapters.

It's a hardwired control unit that gives you unparalleled simplicity and flexibility.

It's field upgradable to the next larger model, so it grows as your system grows.

But there's more to the Memorex 1270 Model 8 Terminal Control Unit than reliability, flexibility, availability and cost effectiveness.\* The specifications tell the whole story. For complete information about the Model 8, other 1270s and the entire Memorex family of display terminals and printers, contact Nancy DeKraker at (408) 996-9000 or write to Memorex Communications, 18922 Forge Drive, Cupertino, CA 95014.

# MEMOREX

Communications Excellence

\*The 1270 Model 8 is available in the Continental U.S. only. © 1980 Memorex Corporation. Memorex is a registered trademark of Memorex Corporation.

## IDC October Conference To Focus on Productivity

SAN DIEGO — "Information Processing Profitability and Productivity in the 1980s" will be the subject of International Data Corp.'s (IDC) Fall Executive Conference here Oct. 19-22. The issue of falling productivity in both factories and offices will be addressed.

The conference will examine the nature and dimension of the productivity dilemma in relation to what today's information processing executive can do to improve productivity within his own organization. The agenda includes a program in personal productivity improvement through physical fitness and improved life-style manage-

ment, led by former Nasa astronaut trainer Rob Rideout.

Immediately following the IDC conference is "The New Electronic Media" conference, sponsored by the Link Resource Group, a subsidiary of IDC. It will take place Oct. 22-24, and anyone attending the IDC program is invited to stay for all or part of the Link event at no extra charge.

Conference registration (IDC) is \$750; the fee for additional company members is \$495. More detailed information is available from the IDC Conference Coordinator at 214 Third Ave., Waltham, Mass. 02154.

## Climate Control Malfunction Annihilates Laboratory Mice

LOS ANGELES — Murder by computer is apparently a reality here at the University of Southern California's Andrus Gerontology Center, where a malfunction in a computerized climate control system was blamed for the death of more than 1,500 laboratory mice.

The mice died when temperatures in the basement storage area rose to 106° F from the preset temperature of 72° to 78° F. Scientists, who described the scene as reminiscent of the Guyana massacre, said 1,500 of the 2,000 laboratory mice were found dead, and most of the 500 survivors have either died from shock or have been rendered useless for further experiments.

The mice were part of an estimated \$1 million worth of federally financed biological research projects being conducted at the center. Dr. Harold Slavkin, a scientist at the center, estimated it would cost the university about \$75,000 to replace the mice.

He also said much of the research in which the mice had been used might have to be repeated.

Some of the mice had been specially bred for specific research. Others, at the crucial age of 30 months — the equivalent of an 80-year-old human — were being used as part of a study into the effects of aging on the brain and the body, Slavkin noted.

Slavkin did not know what kind of climate control system was being used at the center, and school officials were unavailable for comment.

## Computer Gives Bay State Unions Political Clout

BOSTON — Massachusetts is one state in which organized labor will have more power to inform and persuade its members in time for Sept. 16 congressional primaries, thanks to computer power.

Although Massachusetts' AFL-CIO previously used a "long and cumbersome" manual system to prepare address labels for bulletin mailings to its 500,000 members, that task can now be accomplished in one day, according to John A. Callahan, director of the state's Committee on Political Education (Cope) — the political arm of the AFL-CIO State Labor Council.

Formerly taking about a week for a mailing to go out to members, the method now involves a single phone call to national AFL-CIO headquarters in Washington, D.C., where data on the group's 13 million national members is stored in a Univac 9030 computer with 512K bytes of memory.

Any mailing labels the state unit requests are generated in Washington and sent directly to the state for its mailing purposes. Such mailings, which contain information on the voting records of congressmen, the status of legislation on issues like job safety, collective bargaining rights and disabled workers' benefits, may go out two or three more times before the upcoming primary, according to Callahan. "It's a tremendous improvement," he concluded.


While the state theoretically could have tapped into the national system before now, "we didn't have the money," Callahan explained. Funding for the operation was approved at the AFL-CIO's state convention two years ago.

"The system is very standard in a sense, but yet it's not, since each state can do what it wants [with the system]," according to AFL-CIO Computer Department Director Richard Drenan.

"The extent to which a state is successful with it, or uses it, depends upon the state. You can have a file and use it, or you can have a file and not use it" — exactly what Massachusetts has done until now.

Pace your professional growth in

## THE DP NETWORK REVOLUTION!

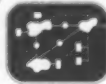


Taught by:  
■ Jowett  
■ Shrago

**Learn Optimizing Voice Networks**

Who says talk is cheap? Major expenditures are involved in voice networks. Learn to manage, design, evaluate and modify your voice network. Learn dollar benefits. Learn management criteria. Learn transmission considerations. James E. Jowett and Jacqueline B. Shrago, two leading voice network experts, teach the seminar for planners, analysts and managers. Send today for full seminar information.

November 12-14, 1980  
LOS ANGELES




Taught by:  
■ Kenneth  
Thurber

**Learn Local Network Architectures**

How can you create your own local DP network using existing, diverse equipment? Which commercially available local interconnect systems can you use? Learn about the trade-offs. Learn about cost-effective high-performance bus structures. Dr. Thurber is a well known contributor to the fields of bus structures and distributed processor interconnections. Send today for full seminar information.

December 1-3, 1980  
SAN FRANCISCO



Taught by:  
■ Pouzin  
■ Sunshine


**Learn Network Protocols**

What are the rules of the game? Computers can't communicate without protocols. Understand the protocol issues involved in computer design, transmission media, and a multitude of applications. Louis Pouzin is a well known speaker and writer with a superb ability to present complex subjects in simple language. Carl Sunshine is known internationally as an expert on computer network protocols. Send today for full seminar information.

October 20-22, 1980  
NEW YORK

Six professional,  
career-boosting  
seminars from

**TRANSFER  
TECHNOLOGY  
INSTITUTE**

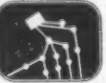


Taught by:  
■ Leonard  
Kleinrock

**Learn Computer Networks**

Learn the real magic of DP networks. Get up to speed in DP networks fast. This seminar teaches users, managers and analysts the best ways to implement, evaluate and optimize the network concept. Learn measurement and design. Learn resource sharing concepts and flow control. Dr. Kleinrock, recognized world authority on computer networks, will give you the very latest on computer networks. Send today for full seminar information.

November 18-20, 1980  
BOSTON




Taught by:  
■ Wushow  
Chou


**Learn Planning Data Networks**

Is your network cost-effective? How can you prepare for changes? What is your strategy for future demands? Learn the techniques for network planning. Dr. Chou has created many techniques for optimizing, simulating and analyzing data communications systems. Dr. Chou is Professor of Computer Science/Electrical Engineering at North Carolina State University. Send today for full seminar information.

December 3-5, 1980  
SAN DIEGO

**3-DAY  
SEMINARS**





Taught by:  
■ Kleinrock  
■ Chou  
■ Roberts

**Learn from Experts on Networks**

Leading network innovators give an overview of the network concept. Learn the latest techniques for utilization and management. Learn through actual case studies in network planning. Dr. Leonard Kleinrock is a recognized world authority on computer networks. Dr. Wushow Chou is a leader in network optimization and evaluation. Dr. Lawrence Roberts developed the first operational packet-switching network. Send today for full seminar information.

October 29-31, 1980  
WASHINGTON, D.C.

Please send me detailed information about these

### NETWORKS SEMINARS

**TRANSFER  
TECHNOLOGY  
INSTITUTE**

P.O. Box 49765

Los Angeles, CA 90049 (213) 394-8305

CW 918

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Call TODAY:  
(213) 394-8305  
Ask about these and our other  
SEMINARS OF EXCELLENCE



# Pioneer 4331 Installation Braves Software Snags

By Rita Shoor  
CW Staff

LOMBARD, Ill. — "The hardware went in smoothly... [but] the software was a little different."

That's how Andrew Filipowski, president of DBMS, Inc. here, summed up what is said to be the first installation of a configuration including IBM's 4331 with two 3370 fixed-block architecture (FBA) disks and the vendor's 600 line/min Model 3262 printer.

While he lauded the efforts of IBM's support staff to help with the DBMS installation, everything about the software was a surprise, according to Filipowski.

The peripherals required Release 2 of the DOS/VSE operating system and there was no System Installation Product Option (Sipo) available for this particular configuration, he explained. "Every component in the system had to be generated separately."

Another problem encountered by the system technicians employed by the software products and services firm was the inability of OS/VSI to support the 3262.

Eventually, this problem was solved by getting OS/VSI to run under VM with Release 2 of IBM's Basic System Extensions, he said.

## Around the Clock

"If it weren't for the exceptional skill of our [in-house] personnel, it could have been a disaster. But by working around the clock, we were able to bring up and tune all the software within 10 days," he said.

This success came about "in spite of the fact that we were clearly pioneering with almost every software item," the firm's representative remarked.

In contrast, "the hardware went in smoothly," according to a company spokesman. "The only exception was that we received blue panels on our printer instead of brown."

Delivered to DBMS on June 22 and

installed by July 10, the configuration includes the 3262 printer which Filipowski described as a "very low-cost device that could make the whole package very attractive" from a cost/benefit standpoint.

The firm had opted to purchase the system, consisting of the 1M-byte 4331, two 3370s with a total of 1.2G bytes of peripheral storage and one 3262 printer, for approximately \$210,000, he said. The two-year lease price for the printer alone had been quoted as \$373/mo, he said.

That price range was acceptable to DBMS, which did approximately \$3 million worth of business in fiscal 1980.

While some firms have had delivery problems with 4331-based systems

[CW, May 12], DBMS was very fortunate in IBM's 4300 series lottery, Filipowski recalled. "We were lucky to get an early ship date in the lottery," he said.

"However, we should have requested more 3370 disk units with that original order," he said. "We ordered two more 3370s the day our system was delivered and IBM gave us a shipment date of Jan. 7, 1983."

He felt that the vendor might have underestimated the user demand for the 3370 and is now "trying to discourage orders" for that device.

The alternative for DBMS is the 3340 disk subsystem which Filipowski said had a much higher cost per byte than that offered by the 3370. Although the 3344s, which can be tied to the 3340,

are more price-competitive with the 3370, at least one 3340 is required, he said. However, "in order to protect ourselves, DBMS has ordered a 3340 subsystem as well as the 3370s."

"We may not be as cost-sensitive as other installations," he said. "If we need the disk space, we'll get it." Therefore, the 3344s are considered to be an interim solution to future storage problems, he noted.

After reviewing the cost differential between IBM's 4331 Model 2 and its 4341, DBMS has also opted to place a 4341 on order for November 1981. The larger machine was ordered because the cost savings for the Model 2 did not make up for the increase in processing power offered by the 4341, he said.

When you think about your data processing career, remember

## BEFORE THE APPLAUSE COMES THE PERFORMANCE



Taught by:  
**K. Mani Chandy**

### Learn Designing for Performance

Your system's performance starts with design. Learn the best management approaches. Learn how to set goals. Learn how to manage your DP performance within an existing or proposed system. Learn the pitfalls. Learn the solutions. Dr. K. Mani Chandy, a leading consultant to industry in the field of DP performance and a pioneer in the application of queueing network models, will show you how. Send today for full seminar information.

December 1-3, 1980  
WASHINGTON, D.C.



Taught by:  
**Buzen  
Denning  
Schwetman**

### Learn Capacity Planning

A comprehensive moment-of-the-art review for analysts who want to learn how to use models in practice. Three outstanding lecturers share their expertise with you. Learn planning. Learn prediction. Learn options. Answer your planning questions with this important block of information and insights. Send today for full seminar information.

October 1-3, 1980  
HOUSTON



Taught by:  
**AI Avizienis**

### Learn Reliable Computing Through Fault-Tolerance

Learn the techniques that make perfection in hardware and software unnecessary for uninterrupted information processing! Learn how to build a system that tolerates failures. Professor Avizienis is referred to as "the father of fault tolerance." Learn how to implement productive fault-tolerant systems. Send today for full seminar information.

November 19-21, 1980  
LOS ANGELES



Taught by:  
**Peter Denning**

### Learn Performance Evaluation

Don't guess. Know. Learn how to evaluate your present or projected system's performance accurately and confidently. Learn the implications of workload changes. Learn verification. Learn measuring. And learn it all in simple terms that do not require advanced theoretical concepts. Dr. Denning, President of the ACM, is one of the world's best known authorities on the design and control of operating systems. Send today for full seminar information.

November 17-19, 1980  
BOSTON



Taught by:  
**Charlie Bachman**

### Learn Advances in Database Technology

Charlie Bachman, the founder of modern database systems, gives you answers in his seminar. Learn the latest database developments. Learn about distributed databases, mutual support of CODASYL and hierarchical data systems. This advanced seminar introduces you to the work station model of applications systems, data storage and retrieval concepts, and interprocess communications concepts. Send today for full seminar information.

December 3-5, 1980  
LOS ANGELES



Taught by:  
**Leonard Kleinrock**

### Learn Queueing Systems

Wait no more. Learn how to deal with queueing problems quickly and efficiently. Learn prediction. Learn solutions. Learn alternatives. Learn the advanced techniques that solve your problems — in many cases before they happen. Dr. Kleinrock, teaching from his latest two-volume text and with his rare gift for expressing complex concepts in everyday language, makes his seminars enjoyable, relaxed and fun. Send today for full seminar information.

October 22-24, 1980  
HOUSTON



3-DAY  
SEMINARS

Call TODAY:  
(213) 394-8305

Ask about these and our other  
SEMINARS OF EXCELLENCE

Please send me detailed information about these

## PERFORMANCE SEMINARS



P.O. Box 49765  
Los Angeles, CA 90049 (213) 394-8305

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

CW 98

## Asimov to Open Strategy Seminar

WHITE PLAINS, N.Y. — Dr. Isaac Asimov, noted science fiction author and lecturer, will keynote a seminar on "Information Strategies for the Eighties" (IS-80) here on Sept. 30-Oct. 2. Sponsored by Turnkey Systems, Inc., the conference will emphasize new and emerging computer-based productivity methods.

"Yesterday's Science Fiction Is Today's Reality" is the title of Asimov's presentation.

Other keynoters will include Charles P. Lecht, president of Advanced Computer Techniques, who will speak on "The '80s: Harnessing the Power We Built in the '70s," and Gideon Gartner, president of the Gartner Group.

Attendance at IS-80, which will be held at Stouffer's Inn of Westchester, is limited to 200 enrollees. The fee for the seminar is \$965.

More information and registration forms are available from Turnkey Systems, Inc.'s Education Division, 50 Washington St., Norwalk, Conn. 06854.

# Group Meets to Strengthen Role of Minorities

By Bruce Hoard

CW Staff

WASHINGTON, D.C. — Black Data Processing Associates (BDPA) will elect national officers, formally accept its charter and generally try to consolidate and solidify its national identity at the group's second annual meeting here the 21st and 22nd of this month.

The approximately 750 members will also take in technical and vendor displays and attend a workshop in business opportunities, according to Earl

Pace, BDPA national coordinator and one of the organization's cofounders.

Organized in 1976, BDPA is devoted to "strengthening the expertise of the minority members of the DP community," Pace said, adding the organization is working to "offer this expertise to those minorities who are evaluating DP for its career/business potential."

"Here's an opportunity for someone to throw off the discriminatory labels we have lived with and do something good," the national coordinator said.

The minority group is hoping to attract more members by participating in such high-profile activities as outreach programs for high school and college students, Pace said. To date, an arm of the organization has worked with handicapped students at the University of Pennsylvania and several public schools in Philadelphia.

Although predominantly black, BDPA membership also includes some Hispanic DPs, Pace said. "Although the objectives of our association are directed toward the minority members of the DP profession, our membership

Progress is coming in the form of more and more minority-owned DP organizations, he claimed, saying he knows a dozen minority members with DP businesses of their own.

Tracing the history of minorities in DP, Pace discussed his own beginnings in the field and said other minorities traveled similar paths.

When he graduated from college in 1965, there was a great national furor over the Civil Rights Act and the age of tokenism was dawning, he said. Pace sought work in labor relations with the Pennsylvania Railroad.

The young graduate was stifled because one black was already employed in that department and "they quote, end quote, did not have any openings," he claimed. However, there was an opening in the DP department and no other minority had applied yet. So Pace filled the slot after taking a test he still has doubts about passing 15 years later.

Eventually, the industry grew so fast, labor demand outstripped available supply and blacks found themselves able to find jobs where before they couldn't, he said.

## Best and Worst

He labeled the Northeast Corridor between Washington, D.C., and Boston as the best area for black DPs to seek jobs because of the many computer companies and manufacturers there. But, somewhat paradoxically, he claimed the New England area is the most likely place for blacks and other minorities to encounter discrimination. "I place the New England area as a place of subtle discrimination," Pace said.

Ironically, the Sunbelt states of the southern and southeastern U.S., traditionally bastions of racism, are now the up and coming places for minorities to find DP employment, he claimed.

"As a whole, the southern states are desegregating faster than the northern states and New England," he declared.

*'Ironically, the Sunbelt states of the southern and southeastern U.S., traditionally bastions of racism, are now the up and coming places for minorities to find DP employment.'*

is open to all persons, in accordance with our current bylaws, regardless of race or sex," he added.

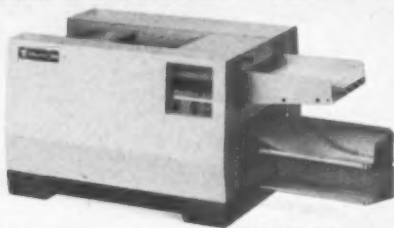
With the addition of new chapters in Washington, D.C., and Cleveland, and the possibility of expansion to Atlantic City, N.J., Dallas, Atlanta and Oakland, Calif., Pace promised the BDPA will be more aggressive in the upcoming year.

## Racism in Industry

"Very subtle," was his reply when asked about the state of racism in today's U.S. DP industry. Only the rapid growth of the industry has made it possible for blacks and other minorities to gain a foothold on jobs, and most of those jobs have been lower level, data entry type of positions, he said.

Pace is anxious to see minorities leave "the computer room and coding pad behind" and move up the managerial ladder. "I think DP organizations owe minority employees some preparation so they can move to those higher positions," he commented.

## LOW COST DATA ENTRY DEVICE.



**\$600<sup>00</sup>\* PER MONTH**

\*Less than 1/3 the cost of a key entry operator.

Call Toll-Free:  
1-800-328-4646, Ext. 70  
Minnesota: 1-800-752-4242  
Minneapolis/St. Paul: 340-0505



**National Computer Systems, Inc.**

4401 West 76th Street Minneapolis, MN 55435

**If you think  
all printer suppliers  
are pretty much alike,  
you're all wet.**

## CMC offers a service difference.

Computer Maintenance Corporation can sell you a serial or line printer for as much as 40% less than the CPU manufacturer's price for the identical printer. But so can other independent printer system suppliers.

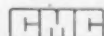
The difference is that CMC will install and service your printer with its own maintenance organization—something that other printer suppliers can't do. With CMC you not only get extraordinary savings. You also get the peace of mind of proven service support.

**Call CMC collect:  
(203) 325-3514.**

Tell us your printer and interfacing requirements. If you're still paying list price, or settling for inadequate field support, we can save you from taking a hosing.

Computer Maintenance Corporation,  
22 Fifth Street,  
Stamford, CT  
06905

Authorized  
Data Products  
Distributor



## Call for Papers

**SECOND ANNUAL DP PERFORMANCE MANAGEMENT CONFERENCE**, Phoenix, Feb. 22-26, 1981.

The second annual conference is being arranged by Applied Computer Research of Phoenix and Performance Management Associates of Scottsdale, Ariz. The focus of the four-day program will be on "Using Performance Management to Improve DP Productivity."

Presentations will be management-oriented, interactive and do not require formal papers, although A/V reproductions are requested for the audience.

Areas to be addressed at the conference include DP productivity measurement, productivity in development, management of change, pricing DP services, fulfilling user service objectives, the role of planning in PM, problem resolution and using PM to improve DP productivity.

More information is available from Jim Christensen, Conference Coordinator, Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

**COMPUTER LAW JOURNAL, SPECIAL ISSUE.**

The Computer/Law Journal has issued a call for papers for a special two-issue set entitled "Law and Information Policy" to be published in early 1981.

Papers are being sought in all areas of the information process, from the legal aspects of fact-gathering, to information storage, retrieval and transmission.

Topics of interest include privacy, protection of data bases, viewpoint and similar systems, transborder data flow, access to government data bases and cryptography.

Guest editors for these special issues are Dr. Jon Bing and Prof. Selmer of the Norwegian Research Center for Computer and Law.

Authors interested in submitting papers for these issues should write Bing at the Norwegian Research Center for Computers and Law, Oslo University, Karl Johans Gt. 37, Oslo 1, Norway, or to Michael Scott, Editor in Chief, Computer/Law Journal, 530 W. Sixth St., 10th floor, Los Angeles, Calif. 90014.

**ELEVENTH CONFERENCE ON COMPUTER AUDIT, CONTROL AND SECURITY**, New York, May 4-8, 1981.

The conference is jointly sponsored by the EDP Auditors Foundation, Inc. and Automation Training Center, Inc.

"How to" papers are wanted on new approaches to problems, pioneering efforts in advanced systems, case histories and new audit, control or security techniques.

Authors wishing to submit a paper should send a brief abstract which includes the key ideas and approach to the topic of the paper. A brief personal resume and business telephone number are also requested. Abstracts submitted from outside North America should explain the proposed talk in great detail.

Abstracts must be received no later than Oct. 1 by Harold Weiss, program chairman, Automation Training Center, Inc., Suite 17, 11250 Roger Bacon Drive, Reston, Va. 22090.



# Uncovers 1,200 Thefts Yearly Boston Edison Computer Tracks Power Thieves

By Bruce Hoard  
CW Staff

BOSTON — Computers played a key role in the arrests of nine people charged with stealing between \$15,000 and \$20,000 worth of electricity from Boston Edison Co. here last week.

Boston Edison's IBM 370/158 has also led company officials on a path that may culminate in the arrests of 100 additional energy thieves, who have collectively stolen some \$50,000 worth of power from the utility, according to a spokesman.

The customers arrested last week, from nearby Stoneham, were accused

of altering their meter readings for periods ranging between two months and a year. If convicted, they could be penalized by up to a year in jail and a \$1,000 fine. They would also be required to make reparations for the stolen electricity.

## Millions Recovered

The utility has unearthed an average of 1,200 cases of theft yearly since it implemented its computer detection strategy in 1975. About \$4,000,000 has been recovered over that four-year period.

Boston Edison is confident it can do even better, saying once all the bugs are worked out of its system it will be

able to spot suspicious accounts more easily and with more regularity.

The basic detection strategy is a simple one. The utility, which serves 550,000 customers in 40 Greater Boston cities and towns, uses the computers to seek out accounts with large disparities in the amount of electricity used from one month to the next. The spokesman refused to divulge anything beyond that, citing security reasons.

Currently, about 100 suspicious cases weekly are being called to the attention of field surveillance and meter reading personnel assigned to track offenders, the spokesman claimed.

Not far away in Westboro, Massa-

chusetts Electric Co., an even larger utility, serving 750,000 customers throughout western and central Massachusetts and the Merrimack Valley, is using similar tactics to trap thieves.

That utility uses its IBM 370/168 and 370/158-based computer system and a corp of approximately 10 full-time field investigators to study historical billing periods and match records, according to Dick Nadeau, Mass Electric System Diversion Manager.

"Right now, the computers are not effective as the field investigators, but we feel they are pointing us in the right direction," he said. That direction led to 745 arrests and the return of \$556,000 in 1979, he reported.

## Sotheby's to Hear Computer Bids

By Bruce Hoard  
CW Staff

NEW YORK — "What am I bid for this beautiful IBM 370/168 computer system used only on Mondays by an office of elderly accountants in Fort Lauderdale?"

Such a seemingly outrageous line may actually be heard at the Sotheby Parke Bernet, Inc. Business Systems Department's inaugural computer hardware auction here this fall.

Sotheby's, a firm that has auctioned off books, fine arts and "just about everything under the sun for 250 years," is now expanding to include computers, according to John Carr, director of the Business Systems Department.

From a mailing list of 20,000, 1,200 companies requested auction catalogs and probably a third of them are willing to sell their equipment at Sotheby's auction, Carr claimed.

He is hoping to highlight the auction with several large IBM mainframes, but also plans to include plug-compatible mainframes and "an array of peripherals, minis and non-IBM hardware. We're going to sell what the market demands."

If the first auction is successful, the firm will continue running them on a quarterly basis at Sotheby's new gallery at the corner of 72nd St. and York Ave. in Manhattan and at other sites around the country.

"We may have peripheral auctions even more frequently than that," he declared.

Sealed, open-floor and telephone bids will be accepted at the auction, which Carr said was made possible by the rapid growth of the used computer market.

## Eastern Airlines Sets Univac 1100 Courses

MIAMI — Eastern Airlines' Computer Education Department will offer 30 courses, ranging from one day to two weeks, oriented toward Univac 1100 software systems.

The courses, slated to begin Nov. 3, will feature specialized but practical technical education in the areas of demand and real-time communications, the department said.

Details and enrollment information are available from Gail Fraser, Eastern Education, Eastern Airlines, Miami International Airport, Miami, Fla. 33148.

Take everything you knew about DP Productivity and FORGET IT!

Attend The James Martin Seminar with its new emphasis on DP Productivity  
SEND FOR FULL INFORMATION

## JAMES MARTIN SEMINAR

Management Strategy ■ Distributed Processing ■ Data Base ■ Office-of-the-Future ■ Computer Networks

Productivity is the real magic to your DP. Does it produce? In five intensive days of lectures by James Martin you have the facts, techniques and methods that evaluate, design and modify your DP system.

### APPLICATION DEVELOPMENT WITHOUT PROGRAMMING IS THE KEY TO PRODUCTIVITY.

The James Martin Seminar focuses on this technique for productivity. Learn how the DP revolution gives you tremendous new opportunities for corporate DP strategies. Achieve gains. Evaluate changes in traditional DP methods. Step out of the trenches for five days. Share James Martin's new perspective.

|                  |                      |
|------------------|----------------------|
| HOUSTON          | October 20-24, 1980  |
| WASHINGTON, D.C. | October 27-31, 1980  |
| HONOLULU         | November 10-14, 1980 |
| BOSTON           | November 17-21, 1980 |

### ONLY JAMES MARTIN COULD GIVE YOU THIS SEMINAR.

James Martin is the world's best selling author of computer books. His reputation as one of the finest lecturers in the DP field is unchallenged. *Computer Weekly* described James Martin as "the computer industry's most widely read author and best attended lecturer."

James Martin's seminars always include his opinions of recent developments and predictions for what is to come in the DP field. In the past, his predictions about technology have proved uncannily accurate.

### NOTICE

If you have attended the James Martin Seminar in the past, then send for information on this new, updated presentation. Learn how much more has happened since you last attended!

Call or write today: (213) 394-8305

SEND FOR FULL INFORMATION ABOUT THE JAMES MARTIN SEMINAR.

Technology Transfer Institute  
P.O. Box 49765  
Los Angeles, CA 90049 (213) 394-8305

TECHNOLOGY  
TRANSFER  
INSTITUTE

P.O. BOX 49765, LOS ANGELES, CA 90049 (213) 394-8305

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone \_\_\_\_\_

CW 9/8

# Concepts Do Not Transcend Tools

## Computer-Generated Art Still Has a Way to Go

By Marguerite Zientara  
CW Staff

SYRACUSE, N.Y. — Great artists have always dealt with concepts that were way beyond the tools they used, according to artist Joseph Scala, and therein lies the problem in computer art today. "At the moment, people using computers are dealing with the tool and not dealing with concepts that transcend the tool."

Currently in his third year as Director of Galleries for Syracuse University, Scala has virtually stopped "making art," as he calls it, and instead concentrates on displaying other people's masterpieces.

Although he still likes, sells and exhibits his past works, Scala is in a "dry period" as far as his own creativity goes, and one reason for it is the dissatisfaction he felt with his so-called "computer art."

"I ended up spending more time on the technology than on the art," he recalled. "The tool became more important and time-consuming as I progressed and I also became very discouraged with the output."

"The final printed output either looked too mechanical — it looked like it was made by a machine — or it lacked the human touch, an element that I felt was necessary in art," Scala said.

Scala quit computer art two years ago. Although from 1970-1978 he believed in the natural partnership of art and technology — as witnessed by the designs on these pages, made during that period — he has since undergone a complete change in viewpoint.

Emphasizing that his views are "strictly personal and related to myself" as well as subject to change, Scala maintained that computer technology has not evolved to the point where an individual can truly express himself in an original way using it.

"I'm not putting down computer art, but it has a long way to go before any significant art will come out of it," he contended. "Most so-called computer art, with very few exceptions, has been produced by scientists and engineers who have no sense of art."

"These pseudo-artists — unless they happened to have a machine that makes designs — would otherwise never attempt to make any art."

### Classical Training

Scala, on the other hand, has wanted to be an artist "as early in my life as I can remember" and early on received a "very classical training in the arts." Nevertheless, he eventually studied for and received a B.S. degree in math because it was more practical than art.

After nine months in his first job as an engineering aide in a defense plant, Scala "couldn't stand it" and resigned. Scala then taught math in a secondary school and eventually, in 1969, enrolled in Cornell University's graduate program in fine arts — where he first encountered the computer.

After graduating from Cornell, Scala took a teaching position at Syracuse University's Department of Experimental Studios. Searching for contemporary technology to apply to art took Scala to a computer graphics workshop conducted by computer artist Dr. Ken Knowlton from Bell Telephone



Figure 1

Joseph Scala, shown in Figure 1, has used computer programs to design the commercially applicable work shown in Figure 2 and Figure 3 as well as the artistically 'purer' applications on the next page.

Laboratories, Inc.

It was Knowlton's software package for artists, Explor, that "opened up a new world" to Scala and his students and launched his eight-year period of computer-aided artistry.

### Less Than Ideal

While Scala maintained his enthusiasm for the medium for almost a decade, he now looks back on the period as something less than ideal. "Even then, I often found myself changing the work — putting my hands in and making the computer output different," Scala recalled. "I'd add either paint or color or something, because I didn't like the mechanical end result."

"Either it looked too much like everybody else's computer artwork or it had some personality on it other than my own," Scala said, attributing that to the fact that he generally used programs written by other people.

"[Knowlton's] package generated a certain look which bothered me because it was more Knowlton than it was me," he said. "You got to the point where you had to invent your own software and even then you had to face the problem of the output with that machine-look."

And Scala "wasn't that interested in writing original software programs from scratch. First of all, I found it was fruitless because [the artwork] all came out looking alike anyway," he said. "So I never bothered to do that and just manipulated the packages I had."

Computer-aided video output, on the other hand, does not display the artificial look of hard copy output and allows the artist necessary self-expression, Scala maintained.

However, "in going to paper in any way, you have the whole history of art that that piece of paper has to go up against, and computer technology hasn't reached the point of sophistication to compete with art drawn by human hands," Scala said.

In such cases, "the hardware and the



Figure 2

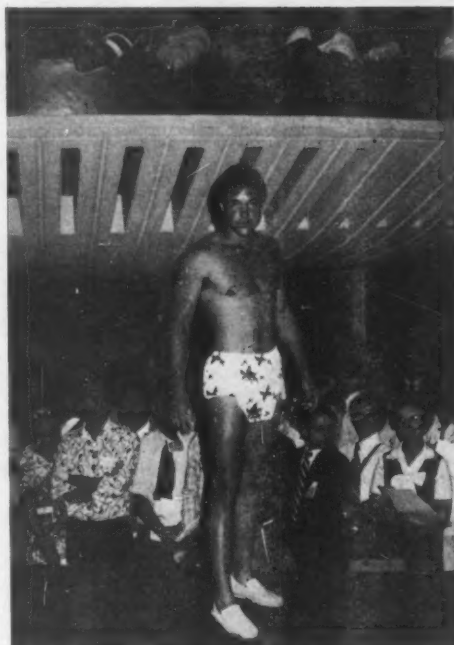


Figure 3

software get in the way of the art," Scala said. "The technology hasn't reached the point where an artist can really use it to say anything that's aesthetically new — the technology's new, but the art isn't."

"Even though there are some things that can be done much more quickly with the computer, very complex patterns done at great speeds, no one has yet been able to make any artistic statement of any significance that couldn't have been done just as well some other way," he added.

Emphasizing that the situation could change with increased sophistication

of the technology, Scala noted, "I don't want people to think this is my proclamation forever."

"Some Leonardo DaVinci-like genius could come along and do marvelous things with the computer, but we haven't yet reached that point," he added.

On the other side of the coin, Scala suggested, "the computer could actually change the aesthetic tastes of a whole generation, so that what people look at now as being uninteresting, in 25 years may be extremely important and may even be the only art that's significant."



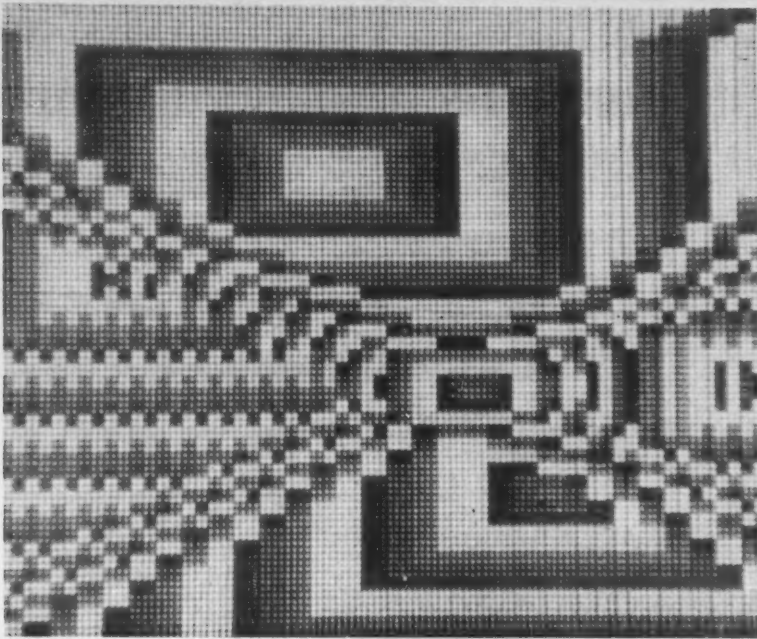


Figure 4

*'I even got orders for the stuff; they wanted to buy it, but the students didn't want to sell it,' Scala recalled. 'I think it's something that is going to come into the mainstream of the textile and fashion design business very shortly.'*

## 'Art, But Not Great Art': Computer Prints Images Suitable for Framing

SYRACUSE, N.Y. — Calling his computer-generated designs "art, but not great art," Joseph Scala offered some insights into exactly how they were produced.

The graphic design "Exploring" (see Figure 4) originates from a program called Explor, designed especially for artists by Dr. Ken Knowlton, another well-known computer artist.

Explor, which stands for the production of images from Explicit Patterns, Local Operations and Randomness, allows images to be printed on a high-speed line printer, making the time between execution and finished print extremely fast, Scala explained.

"In fact, with our [Digital Equipment Corp.] Decwriter terminals, the image is typed back almost immediately," Scala said. Each individual image can be produced as many times as the artist wants and each individual point or area of points can be changed explicitly or randomly by the artist's program.

### Image Manipulation

While the graphic output in such a process is "immediately suitable for framing," Scala said, further work on an image can produce quite a different result.

Figure 2 illustrates what such additional manipulation can produce.

Using several software packages, including Explor and Splat (Simplified Programming Language for Artists), Scala used Syracuse University's IBM 370/155 mainframe and DEC VB-10C display to produce the desired design for printing on the caftan's material.

Splat involves working with a predefined symbol, such as a circle, square, polygon or line, and drawing and manipulating these symbols by writing

a program, "which is closer in concept to the way a traditional drawing is made," according to Scala.

The image produced was then photographed from the CRT screen and its negative was made into a high-contrast, nonhalf-tone print called a Kodalith. The Kodalith, in turn, was transferred to a silk screen and printed on cotton cloth, which was then made into the caftan.

In Figure 3, the same basic process produced the design for the bathing suit's material, with the exception that the output to be photographed was from either a California Computer Products, Inc. plotter or high-speed line printer, instead of a CRT terminal, Scala said. Several such suits, designed and made by Scala's students, were last displayed at the 1978 Siggraph conference in Atlanta.

If you are wondering whether anyone would actually wear such a garment, rest assured that "I even got orders for the stuff; they wanted to buy it, but the students didn't want to sell it," Scala recalled. "I think it's something that is going to come into the mainstream of the textile and fashion design business very shortly."

Figures 5 and 6 are examples of Splat's video output, shown here as photographs of the CRT screen. They were taken from a video entitled "Our Father," which arose from "an idea of putting together things in myself that make me up, and that affected my childhood and so forth," Scala explained. "It just sort of all came together."

The wiggly line traversing the pictures is an oscilloscope voice pattern of a person reciting the Lord's Prayer. The work was produced using the VB-10C and an oscilloscope.

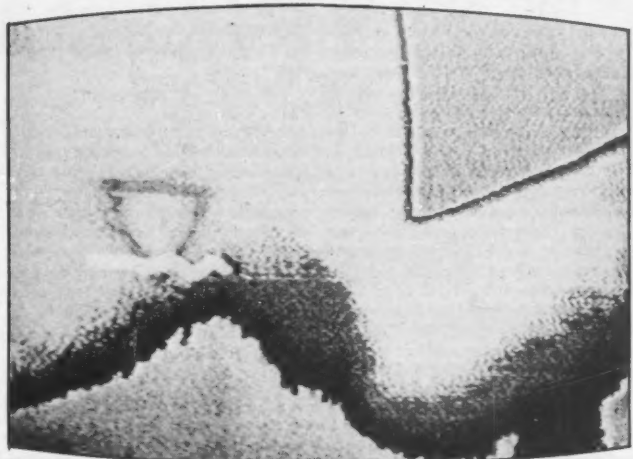


Figure 5

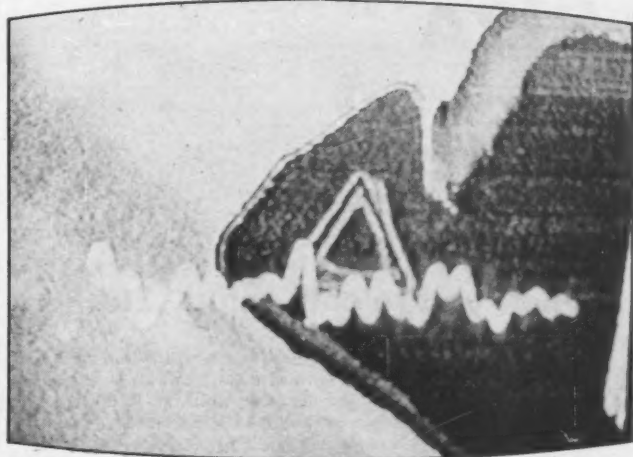


Figure 6

Joseph Scala's more artistic efforts are illustrated here by Figure 4, entitled 'Exploring,' which used Ken Knowlton's Explor program. Figures 5 and 6 are images from a color video display, 'Our Father.'

# While Conservatives Cheer Proposals

## Australian Unions Condemn Technology Report

The long-awaited report by the Committee of Inquiry into Technological Change has finally been released to resounding boos from the socialists but cheers from the conservatives and most of the computer industry.

The report was commissioned by the federal government "to examine, report and make recommendations on the process of technological change in Australian industry in order to maximize economic, social and other benefits and minimize any possible adverse consequences" [CW, Aug. 4] It was prepared by a committee of three men: Prof. Rupert Myers, an academic who, as chairman, gave his name to the so-called "Myers Report"; Allan Coogan, chairman of Nabalco Pty. Ltd.; and Bill Mansfield, federal secretary of one of our most powerful unions, the Australian Telecommunication Employees Association.

Its brief was to identify technological change and its impact, to examine overseas experience and to review the effectiveness of government policies and programs in facilitating the introduction of new technology.

In the U.S., where technological change does not seem to be an issue among workers, such a commission may seem strange. But as I mentioned in my last letter, unions here are extremely concerned about the potential job loss which can be caused by the large-scale introduction of technology.

A meeting of 17 unions representing workers across the board, blue- and white-collar, condemned the Myers Report. There was a feeling that it was a palliative to the union movement to make new technology more acceptable.

Visiting executives from Data General Corp. expressed astonishment that such a concern prevails here. "No jobs are lost by the introduction of technology," according to vice-presidents Barry Fidelman and Rowland Thomas. "Computers free people for other more productive tasks."



### Letter from Australia

By Susan Coleman  
Deputy Editor  
Australasian  
Computerworld

*What better way to learn about the computing scene in other countries than to ask the editors of computer publications? Computerworld recently set up an information exchange with its sister publications, all published by CW Communications, Inc., to do just that.*

The Myers Report advocated speedy introduction of new technology, which it said would promote new profit areas and thus generate more jobs (Australia's unemployed is more than 6% of its potential work force). Ironically, it also recommended provisions to cater to those displaced by the new technology. A "social safety net" provides for compensation payments, after retrenchment, of 60% to 75% of salary for between one and six months, depending on length of service.

In addition, retraining was suggested (but not recommended) to be provided by the retrenching employer.

Should the government accept the recommendations of the report — and it does not have to (its record in implementing the recommendations of commissioned reports is not impressive) — then Australia's indigenous computer industry will get a much-needed shot in the arm. We import almost all our hardware and system software to the tune of \$500 million each year — mostly from the U.S. With our relatively tiny population of 14 million and the lack of venture finance, Australian entrepreneurs have been discouraged from developing a manufacturing industry here.

While the government espouses a "buy Australian" policy, it has done little to ensure there are any Australian machines to buy. So Catch-22 prevails: There are no machines to buy, so there's no money to develop machines which could be bought.

In 1949, Australian scientists of the Commonwealth Scientific Industrial Research Organization, (CSIRO) a government statutory authority, developed one of the earliest potentially commercial computers. CSIRAC, as it was known, was claimed to be not the fastest machine in the world at the time, but the easiest to program (that was foresight!)

"It was easier to program even than Edsac. The language we devised was much more flexible and used considerably fewer instructions," recalled Dr. Trevor Pearcey, who did the logical design of CSIRAC.

But limited finances and a philosophical decision to put what money there was into radio astronomy sadly deprived us of our own computer industry from the outset. Even now there is only one company, CMAD Pty. Ltd., which actually manufactures a processor (a 16-bit computer). All other "manufacturers" buy processors from overseas and add value with software and a little homegrown hardware.

Compare this paltry effort with Sweden's LM Ericsson, which is contracted to supply \$1,200 million dollars worth of computerized telephone exchanges to the Australian telecommunications authority, Telecom. Sweden has a population about half the size of Australia's.

When Australia launches its domestic satellite in 1984, the satellites and the launch will all be supplied by foreign companies — \$200 million added to our national debt.

### Attempt to Lead

The 1,500-page Myers Report urges the industry to "keep up with world technological development and where possible, in areas of particular advantage, attempt to lead." As well as defining the means by which venture capital could be made available, the report recommends that the Australian Industrial Research and Development Incentives Board (AIR and DIB) be restructured to become more autonomous and to have its charter expanded to include funding of public interest projects. The AIR and DIB is a government board which grants money for research and development projects on a dollar-for-dollar basis.

Suggesting, as a possible model, the West German venture capital bank Deutsche-Wagnersfinanzierungs-Ge-

sellschaft (WFG), which is a limited company funded by banks and other credit institutions and the government, the report recommends the establishment of a venture capital corporation "to provide risk capital to individuals and to small and medium-sized enterprises to facilitate the bringing to production and the marketing of promising inventions and innovations."

"The government contribution to the establishment of the corporation should include guarantee of loan funds up to a maximum of \$25 million over 15 years."

The Myers Report sets out to provide a means to reduce union opposition while providing financial incentives to get technology introduced as fast as possible. There is little attention to the side effects of its introduction.

The Myers committee was reluctant to put a figure on the proportion of those presently unemployed, although it conceded some were attributable to technological change. Nor was it prepared to say what the anticipated job loss of the future might be — although it had calculated that it should allocate \$15 million to \$20 million for short-term retrenchment payouts to those who might not find another job before leaving their old ones.

Among the recommendations designed to reduce union resistance to technology are:

- To provide between one and six months' retrenchment payments at a percentage (60% to 75%) of weekly earnings and "assistance to find alternative employment."

- "An employee's perception of what support he will receive after retrenchment can greatly affect his or her attitude to accepting or rejecting technological change," the report said.

- To lower barriers to union amalgamation and to deregister unions with less than 1,500 members.

- To provide for wage margins that more properly reflect skills and responsibilities via broadbanding job classifications into groups within awards.

- To upgrade, via a "bureau of the working environment," work environments to make them more pleasant and more safe as well as to enhance the quality of work through attention to factors such as organization of work and patterns of work time.

- To consider a means whereby payroll tax might be abolished (to encourage employers to hire more and fire less).

- To set up a technology awareness program to promote technological change and its effects on the economy, industry, the labor force and society.

- To enhance the capacity of the union movement to study and respond to technological change.

It is extremely disappointing to find that the committee did not even theorize on job training and creation schemes to assist these people — blandly assuming these aspects will take care of themselves. The 460,000 unemployed attest to the fact that this simply does not happen.

After 16 months and \$1 million, the report contains mainly suggestions for more reports, more surveys, more subcommittees.

## 212A Modem Users:



**Why pay for 1200 and 300 bits per second when you're only using 1200?**

If you're like most 212A users, you're not using the low speed channel, yet you're paying for both speeds. Our MT212D 212A-compatible modem will provide you with the 1200 bps full-duplex communications you need, at a price you can afford. Please call or write for more details.

**MULTI-TECH SYSTEMS, INC.**

*Quality You Can Rely On*

82 SECOND AVENUE S.E. • NEW BRIGHTON, MINNESOTA 55112 • (612) 631-3550 • TWX 910-563-3610



## Report Outlines Four Phases Of Graphics Implementation

WASHINGTON, D.C. — If your firm is among those leaping on the computer graphics bandwagon, it will probably go through four phases during the process, according to Allan Paller, president of AUI Data Graphics here:

- Review of the alternatives.
- Preparation of a plan and hardware/software selection.
- Selling the plan within the organization.
- Implementing the system with training and support.

But, what will make computer graphics implementation both effective and successful? The four phases can be subdivided into a step-by-step process with each of the outlined steps having undergone the test of actual implementation, Paller claimed.

These steps are detailed in a study entitled "Ten Steps to an Effective Automated Business Graphics System."

### Coordinator Selection

First, the organization must survey the available options, according to the study. It suggested selecting a coordinator to spearhead this effort with a small task force assigned to review progress. Classroom training in computer graphics and reviewing the graphics implementation experience of other similar organizations are among AUI's suggestions for the coordinator at this point.

Step 2 involves arranging preliminary hardware demonstrations and software briefings for the task force so that a consensus can be reached on the best approach to graphics implementation, the study continued.

In step 3, which begins the second phase in the implementation process, a plan that includes the following components should be prepared:

- A summary of existing and potential graphics applications within the company and applications which have proven successful in similar organizations.
- An inventory of existing equipment and expertise within the organization.
- A set of hardware and software requirements.

## George Will To Address Usita

CHICAGO — George F. Will, columnist and TV personality, will address the U.S. Independent Telephone Association's (Usita) 83rd national convention here Oct. 6-8. Awarded the Pulitzer Prize in 1977 for distinguished commentary, Will is probably best known for his participation on the weekly "Agronsky & Company" television panel.

Keynote speakers at the conference will also include Charles Brown, AT&T chairman. Other features of the convention are management seminars, an awards luncheon and tours of the Windy City.

Admission is free for Usita members and \$25 for nonmembers. Housing reservations and ticket information are available from Pam Sprandel at Usita, Suite 1201, 1801 K St. N.W., Washington, D.C. 20006

- A concrete plan for a comprehensive training and technical assistance program.

At this point, the firm is ready to select its business graphics software, according to AUI's report. The firm recommended selection of device-independent software because of the greater flexibility afforded to the graphics end user if he decides to expand the graphics applications in his organization at a later date.

Firms that purchase software from the hardware manufacturer are often either limited to a very small number of applications or are forced to rewrite software when new graphics equipment is installed, AUI claimed.

The hardware selection step involves specifying how often graphics will be needed in the organization; what level of graphics quality will be required; whether hard copy, film or color slides are necessary; and the extent to which individual users require direct access to the graphics tools.

Phase 3 — selling the plan within the organization — is best accomplished by arranging customized computer graphics demonstrations for top-level management personnel, AUI pointed out. The demo should be rehearsed and arranged to avoid computer or communications malfunctions.

Hardware and software installation begins the fourth and last phase, AUI noted. Installation should be scheduled so that hardware is delivered to the end-user location approximately two weeks before the software installation team arrives, the report said.

### Business Application

The firm also recommended implementation of a high-visibility business graphics application as soon as possible after the executive briefing had taken place. The client selected by the graphics coordinator for this first application should be the highest level executive in the user department.

In order to ensure the success of this application, the coordinator must determine a specific set of indicators which the client deems as important for monitoring performance in his area.

Next, manual sketches of the charts to be produced by the system are to be prepared for the client's review and approval, according to the study. Finally, the appropriate data is selected and the graphics programming is prepared.

Step 9 in graphics implementation requires the provision of training for the user community, the report said.

Lastly, acceptance of computer graphics throughout a company requires the availability of a technical support group to assist new graphics users with particular applications. This technical support should include access to communications experts and the graphics arts staff as well as programmers, AUI said.

In fact, the firm suggested that a non-programmer be included on the technical assistance team to demonstrate that computer expertise is not necessary for effective graphics utilization.

The booklet outlining these phases is available at no cost from AUI Data Graphics at 1701 K St. N.W., Washington, D.C. 20006.



# AVAILABLE TODAY

## PDP11/23 & RSTS/E DATA MANAGEMENT

### Quodata

Specialists in DEC Systems  
196 TRUMBULL STREET • HARTFORD, CT. 06103

- All DEC hardware means DEC service
- Includes 192Kb, 4-port mux, cabinet, VT100 and DEC installation
- Choice of 10 or 20 Mbytes on two removable disks
- Either \$33,100 or \$36,900 complete

Call now. Myron Congdon  
(203) 728-6777

## A new small Winchester System from the leader in Winchester based microcomputers.



C2-D  
\$5,795

Ohio Scientific has put the new, low-cost, high-performance 8" Winchester non-removable hard disk together with our desk-top floppy disk based system. You get approximately 10 megabytes of fast hard disk capability. And a tremendous cost/performance benefit over floppy only microcomputer systems.

- 52K RAM
  - 8" floppy disk drive for program transport and backup.
  - OS-65U small business operating system.
  - 9-digit, precision BASIC by Microsoft.
- Available in OEM quantities at attractive discounts.

For literature and the name of your local dealer, CALL 1-800-321-6650 TOLL FREE.

**OHIO SCIENTIFIC**  
1333 SOUTH CHILLICOTHE ROAD  
AURORA, OH 44202 • (216) 831-5600

# Handles \$30 Million Daily Money Fund's System Keeps up With Cash Flow

NEW YORK — Each working day approximately \$30 million moves into and out of the \$1.8 billion mutual fund operated by The Reserve Fund, Inc. here, originator of the entire \$60 billion money fund industry.

"Customers will wire in funds one day and take them out the next. You can't get much more liquid than that," noted Bob Kaczorowski, the fund's director of systems de-

velopment.

"The Reserve Fund, unlike other mutual funds, is in business to manage clients' short-term cash, or working capital, by investing exclusively in short-term, high-yield liquid investments such as Treasury bills and certificates of deposit," he said.

The more liquid the funds — the more stress that's placed on the old equation that time equals money — the more vital

it becomes to provide a fast and reliable service.

"Competition in this business is tough and individual depositors and brokers alike expect us to be able to give them an instant report on the funds they have with us. If we can't tell them, they take their money out of the fund and go elsewhere," Kaczorowski said.

## Transaction Processing

A computer system, not surprisingly, is a must for The Reserve Fund's day-to-day operations. Until last summer, the fund had relied exclusively on a single large-scale computer system linked to 32 on-line terminals to manage its activity.

Now, however, it is developing systems based around a transaction processing package called TPS 6 offered by Honeywell, Inc. on its small Level 6 computers.

The Reserve Fund has installed four Level 6s at a cost of approximately \$1.2 million and has a fifth on order for delivery early next year.

"We looked at the market for an easy-to-use software package that would help us to implement transaction-based systems speedily. Further, we liked the backup that several small computers provide and the flexibility of being able to bring in another computer system if we want to start another mutual fund," Kaczorowski said.

"For a company that saw its asset base go from \$180 million to \$2.1 billion over a 22-month period, flexibility is an important consideration."

Using the TPS 6 system, The Reserve Fund is able to do concurrent production and program development work. One Level 6 is dedicated full-time to production, two other systems are employed doing spot duty and acting as backup and the fourth system is used for applications programming.

## Daily Update

The production system is currently handling about 5,000 purchase and redemption transactions daily against a data base of about 140,000 active accounts. Every day the fund's portfolio is evaluated and applied to every account in the system.

All purchase orders — by check, wire or transfer of funds — and all redemption orders are entered through terminals linked to the computer. Modifications to account status, such as address changes, are also entered in the same way.

Other terminals are used by customer service representatives to answer on-the-spot customer inquiries on their ac-

counts and balances.

At the same time, the computer maintains a complete history of transactions and produces the periodic and special reports such as those required by the state and federal governments.

The primary key to the account master file, which stores all shareholder information, is the account number. But the file can also be accessed by the customer's Social Security number, phone number or agent account number, either alpha or numeric.

"If a customer can't remember any of these, we're in trouble," Kaczorowski quipped.

All other computer files are linked by TPS 6 to the master account file. These include transaction history, change history, general mailing and agent mailing files.

## Security Measures

Because of the importance Reserve Fund places on security, it has designed its own access security mechanism using features built into TPS 6. Each operator has an ID and password and is assigned a certain level of security that allows access to certain information only.

There is also a time-out feature to prevent information from being left on the terminal's visual display screen. Depending on the sensitivity of the information, it

will be displayed for a few minutes or just for a few seconds.

The screen data formatting capability of TPS 6 and the multiple key access to files and other features of the system, including recovery features as well as niceties like the time-out feature, have enabled The Reserve Fund to tailor computer systems to meet its requirements in an "efficient and effective manner against a tight time schedule," Kaczorowski said.

Three of the installed Level 6s have similar configurations, being Model 57s with 384K words of main memory, a commercial instruction processor with cache, three 256 M-byte disk drives and two magnetic tape units. The development system, which has ten terminals attached, is a smaller Model 43 system.

ectype

## DIGITAL CASSETTES. FIRST WE MAKE THEM BETTER. THEN WE MAKE SURE THEY'RE BETTER.

We certify every Ectype™ digital cassette we make. Not every other one. For full details, call us toll-free at 1-800-843-9862.

**SYNCOM**  
Your flexible alternative  
P.O. Box 130, Mitchell, South Dakota 57301

## Low Cost Card Punch and Card Reader for DEC HP DG IBM Computers

The CCC 1700A Keypunch Interface can connect your computer, time-share terminal, or any bit serial communicating device to an IBM 129 or 029 Keypunch so it will both punch and read data cards! It's EIA compatible, converts ASCII or any bit serial code to Hollerith when punching, converts Hollerith to ASCII or any bit serial code when reading, and permits the efficient transfer of data through a 900 character buffer. The 1700A operates at all standard baud rates from 110 to 9600. And it requires no special software drivers; standard Basic or Fortran "PRINT" or "WRITE" statements work just fine!



COMMUNITY COMPUTER CORPORATION  
185 West School House Lane • Philadelphia, PA 19144 • (215) VI-1200



## "I LOVE MY COMPUTER" Statues

Now choose from five models: IBM 370, NCR Century, System/3, "plain" (pictured above), or the new "I HATE MY COMPUTER" which shows a frustrated C/P'er strangling his system! Gold-finished, heavy plaster sculptures, perfect paper-weight/conversation pieces. \$9.95 each, postpaid. Brian Productions, 2849 Southfield Rd., Xenia, Ohio 45385

## Save 10%-30% on all your Computer Supplies!

Whatever your computer needs, chances are, we have it — and at considerable savings. We carry a complete line of printer ribbons, disk packs, cartridges, paper and more. Compare our prices. A simple phone call gets you a quote. Call (212) 586-0923.

### MEMOREX® DISKETTES

|                        | 10-40 | 50-90 | 100-190 | 200-290 | 300+ |
|------------------------|-------|-------|---------|---------|------|
| 1-sided/single-density | 3.40  | 3.25  | 3.05    | 2.95    | 2.80 |
| 2-sided/single-density | 5.80  | 5.50  | 5.20    | 5.00    | 4.80 |
| 1-sided/dual-density   | 4.45  | 4.30  | 4.00    | 3.85    | 3.70 |
| 2-sided/dual-density   | 5.80  | 5.60  | 5.20    | 5.00    | 4.80 |
| Minis (5-1/4")         | 3.10  | 3.00  | 2.75    | 2.65    | 2.55 |

Nobody manufactures a finer magnetic product than Memorex® Corporation.

### OPUS® DISKETTES

|                        | 10-40 | 50-90 | 100-190 | 200-290 | 300+ |
|------------------------|-------|-------|---------|---------|------|
| 1-sided/single-density | 3.15  | 3.05  | 2.85    | 2.75    | 2.65 |
| 2-sided/single-density | 4.55  | 4.40  | 4.15    | 4.00    | 3.85 |
| 1-sided/dual-density   | 3.70  | 3.55  | 3.35    | 3.20    | 3.10 |
| 2-sided/dual-density   | 5.30  | 5.10  | 4.80    | 4.60    | 4.40 |
| Minis (5-1/4")         | 3.10  | 3.00  | 2.75    | 2.65    | 2.55 |

Opus® is our economy diskette. The price is lower, but there is no compromise on quality. All our diskettes are certified 100% error-free and come with an unconditional money-back or replacement guarantee!

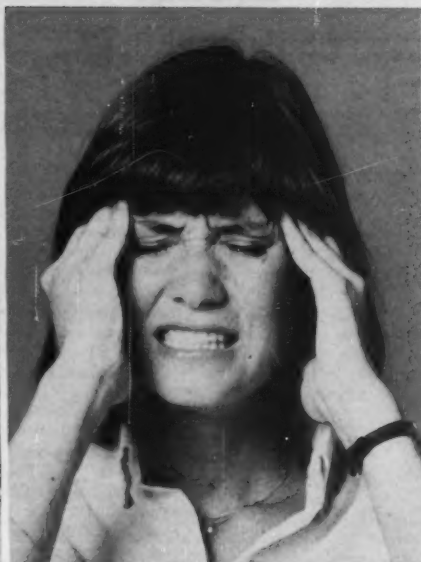
We carry flexible disks for all make systems: Ball Comp., CDC, Data 100, DEC, Decision Data, Diablo, Four Phase, Hewlett-Packard, Honeywell, IBM, 3740, 3741, System 32, System 34 & 3110, NCR, Perlec, Shugart, Syco, Univac and many others.

\* Memorex is a registered trademark of Memorex® Corp.  
\* Opus is a registered trademark of Computer Resources Inc.®

For immediate delivery or for a quote on any other product call...

**BROOKE**  
COMPUTER CORP.

(212) 586-0923  
250 W. 57TH ST.  
NEW YORK, N.Y. 10107  
"The data and word processing discount warehouse"



## Introducing the terminal you've been crying out for.

Operators who use video display terminals all day know what a pain in the neck it can be.

They sometimes experience eyestrain, headaches, backaches, and irritability. Because they try to compensate for visual problems by assuming awkward body positions.

Meet the Ergonomic Terminal™ video display from Lear Siegler. The terminal that makes working conditions easier on the worker.

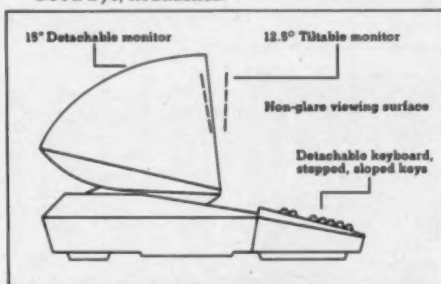
Ergonomics is the successful physical interaction between man and machine. It's the reason the Ergonomic Terminal was designed. For the most comfortable work environment possible and the convenience of the operator.

### IT COMES APART TO KEEP YOU TOGETHER.

With the Ergonomic Terminal ADM-42, you get a large, non-glare 15" screen to cut down on sore eyes, tearing, and blurring. You get a high-resolution monitor (7 x 11 dot matrix characters) for the sharpest picture available. You even have separate contrast and brightness controls. A tiltable monitor lets you reposition the Ergonomic Terminal, so you don't have to reposition yourself. You can separate the keyboard and video

display and locate them in any position you like. And the control base portion of the terminal can be remotely positioned out of the way.

Farewell, eyestrain. So long, backaches. Good-bye, headaches.



### BEAUTY AND BRAINS.

The ADM-42 isn't just another pretty face. It's the smartest terminal in its class with full editing capabilities, a full array of visual attributes, flexibility of format, security, interface, and transmission. Not to mention four-page display as standard equipment. With an optional extended memory capable of adding data space up to a maximum of 8 pages.

The Ergonomic Terminal has a bright, easy-to-read 1920 character display (24 x 80), 128 ASCII character set, and 16 function keys (optionally programmable) that store 32 or 64 characters each.

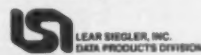
It also comes with a 25th line established and reserved for status indicators and messages of up to 78 characters.

As if all this isn't enough, the ADM-42 comes with options. Galore.

So if you think the terminal you're using now is a real eyesore, consider the Ergonomic ADM-42.

It just may put optometrists and aspirin makers out of business.

Lear Siegler, Inc., Data Products Division, 714 North Brookhurst Street, Anaheim, CA 92803. 800/854-3805. In California 714/774-1010, TWX 910-591-1157, Telex 65-5444. Regional Sales Offices: San Francisco 408/263-0506, Los Angeles 213/454-9941, Chicago 312/279-5250, Houston 713/780-2585, Philadelphia 215/245-1520, New York 212/594-6762, Boston 617/423-1510, Washington, D.C. 301/459-1826, England (04867) 80666.



Modular design allows remote positioning of terminal control unit

Conveniently accessible baud rate and format switches

Detachable keyboard with 16 function keys and numeric keypad



High resolution monitor with optional monitor stand

Adjustable contrast and brightness controls

# The Ergonomic Terminal™ from LSI.



# the **uníq**™ system breaks the UNIX\* software price barrier

**SOFTWARE:** UNIX\* Version 7 Single User License

**CONFIGURATION:** PDP 11/23AA Processor  
128 Kbytes of MOS Memory  
Dual 5 Mbyte RL01 Removable Disk Drives  
H9612 Cabinet  
VT100 80/132 Characters per Line CRT  
DLV11-J 4 Port Serial I/O Interface

**uníq PRICE:** \$21,500.00  
With Dual 10 Mbyte RL02 Disk Drives: \$25,100.00

\*UNIX is a trademark of Bell Laboratories



Computer Corporation  
(312) 879-1566

A SUBSIDIARY OF digital systems house • 143 First Street • Batavia, IL 60510

## you Bet your old Computer is worth BIG MONEY!



For complete information call

**COMPUTER RECYCLING**  
OF AMERICA

NEW YORK OFFICE  
PLAZA RECYCLING CO.  
95-25 QUEENS BLVD.  
REGO PARK, N.Y. 11374  
212-896-7800

MEADVILLE PLANT  
1368 S. MAIN STREET  
MEADVILLE, PA. 16335

ERIE OFFICE  
LINCOLN METAL PROCESSING  
1602 SELINGER AVE.  
ERIE, PA. 16505  
814-838-7828

## System Books Reservations For Condominium Vacations

**SAN FRANCISCO** — After five years in the works, Creative Leisure Corp. here has developed an electronic reservations system that offers travel agencies an effective way to book its resort condominium accommodations.

The firm, which was started in 1969, was founded to offer vacationers this alternative to hotel living. The company has 26 properties in Hawaii and 17 condominium resorts and villas in Mexico.

Six years ago, company president Peter Henze started looking for a hardware system that could provide to a smaller user the sophisticated functions usually required by larger companies.

Further, the firm deals with "a range of products and a variety of customers. We needed software that could handle all facets of studio through three bedroom condominiums and sometimes, villas. But, we also needed something that could accommodate information useful to a budget-conscious family on vacation as well as a millionaire going away for a short trip," Henze said.

### Datapoint Gets Nod

Henze decided on Datapoint Corp. and Creative Leisure has gone through a number of system upgrades ever since. In 1977, the firm installed a Datapoint 4520 with 48K bytes of user memory, 5M bytes of fixed and removable disk storage and a 132-char. printer, for development.

After two years of more system improvements and experimentation, the current software program was refined and put into operation with the Datapoint 4650. The current hardware offers almost three times the capacity of the 4520 with 120K bytes of main memory, and 120M bytes of disk storage attached to 11 on-line terminals, the firm said.

The software was designed by Henze, Creative Leisure systems analyst Mark Silverman and Datapoint systems engineers. Henze saw the need for a custom-designed program when the firm first switched to computer reservations, and found that existing software packages could not accommodate the company's needs, he said.

The current software can hold descriptive information, pricing and up to an 18-month availability for each unit of all the resorts and villas. It also can calculate applicable discounts, required deposits and the total price of the package, which may include additional variables such as airfare, rental cars and transfers from the airport. The system can calculate the total price of a package with a rental car based on type of car desired and number of people, the firm said.

In terms of travel agents, the company's primary liaison in booking reservations, the software offers agents a dollar breakdown of a tour package with agent commissions included. It also stores information on the client such as his name, ages of children, flight numbers, departure dates, itinerary and reservation number, which are then printed on a computer read-out and sent to both the agent and the resort manager.

Following the booking, the system keeps track of payment status, and document status — whether the confir-

mation, voucher and so on have been sent. The system also registers reservations and cancellations on the spot so availability is instantly updated.

### Internal Applications

Another highlight of the system is its application to internal effectiveness. Software programming incorporates analysis reports on Creative Leisure such as accounting and auditing, management and marketing reports in which weekly revenue is broken down by area codes and regions per week. The number of rental cars and transfers is also listed for internal use.

In addition to all this, it produces productivity reports on reservationists and batch reports in which paperwork such as client invoices, vouchers and confirmations is done by the computer in the evening. Creative Leisure's reservation agents, therefore, can focus the whole of their time and attention to bookings and customer service, the firm said.

Recently, Creative Leisure was appointed an industry representative by Datapoint. Under the agreement, Creative Leisure is allowed to sell Datapoint's hardware in conjunction with its software and is the first company to be granted national sales rights, Henze noted.

## Drug Molecules Modeled in 3-D

**LAS VEGAS** — Trying to guess how two molecules fit together without being able to see them is worse than groping for your housekeys in the dark — at least you know the shape of the keys and how they fit into your locked door.

But for years scientists have studied molecules without having any way of seeing how these tiny molecular building blocks stack together to make a drug work in your body.

Now scientists at the University of California-San Francisco's Computer Graphics Laboratory have developed some new computer programs that allow them to look at color 3-D models of molecules on a CRT screen. These moving models can be turned inside out and sliced into sections by a set of computer commands.

These new tools will allow researchers to look at many molecules that are part of proteins used by our bodies.

Four UCSF researchers explained their new techniques recently when they presented papers to their colleagues at the second Chemical Congress of the Northern American Continent. The congress was sponsored by the American Chemical Society.

"Color on the computer is a spectacular tool," said Robert Langridge, Ph.D., director of the Computer Graphics Laboratory at UCSF.

"It enhances the chemical intuition of scientists who are trying to visualize lock and key combinations, called receptor sites, that make the molecules of a drug interact with the molecules in the body."

Langridge and his UCSF colleagues, recently received a \$1 million grant from NIH Biotechnology to continue their work.

# Envelope Design Eases Parish Donation Process

By Ken Halveland

Special to CW

ST. LOUIS — New collection envelopes with bright colored printing and wider top openings have eased donations for parishioner and processing for the staff at the St. Louis Archdiocesan Data Center here.

These envelopes enable parishioners of client churches to insert their donations for regular weekly collections as well as any special collections such as those taken on Holy Days. Sometimes during the year as many as nine or 10 collections are taken in a single month.

The original envelope was a rather plain continuous form having a side opening which made it awkward for the parishioner to handle. It required that the donation be folded in order to

insert it through the narrow opening. And its plainness tended to make it overlooked.

A Standard Register Co. specialist helped by designing a continuous envelope that had a wider top opening, was immediately more familiar to parishioners and certainly easier for them to handle. Colored inks screened on the basic white paper help people differentiate between regular collections and specials.

Depending on each church's requirements, the envelopes are printed with or without a return address with pre-paid postage. Full instructions on how to handle the form are printed clearly and concisely.

Between 10,000 and 15,000 envelopes a month are processed on the

data center's computer and imprinted on each are the envelope number, week of use, parishioner's name, address, title (if any) and Zip Code.

After printing the margins are removed and the envelopes are detached from the continuous web on a Standard Register Series 1000 Forms Buster. They remain in the sequence in which they are to be used by a parishioner and in Zip Code order. They are then put through an inserting operation that places them in window envelopes ready for mailing.

## Designed for Easy Handling

Parishioners return the envelopes with the donations either personally or through the mail. The forms have been designed so that they are equally easy

to handle by the church staff. Perforations below the flap seal and along the right side of the envelope enable parish committee personnel to open them quickly and easily. They note the amounts on the faces of the now empty envelopes and send these back to the data center.

A collection envelope may seem a small item on which to expend time and effort in making it more attractive and simpler to handle, but experience has shown that there is a lot of competition for attention and a document that stands out by reason of its appearance is more likely to get a bigger share of that attention.

Halveland is director of data processing for the St. Louis Archdiocesan Data Center.



Parishioner simply inserts money in envelope at the appropriate time and returns it to the church personally or by mail...



... After the church has removed the contents of envelopes and marked the amount, the envelopes are returned to the data center for entry of information to the computer data base.

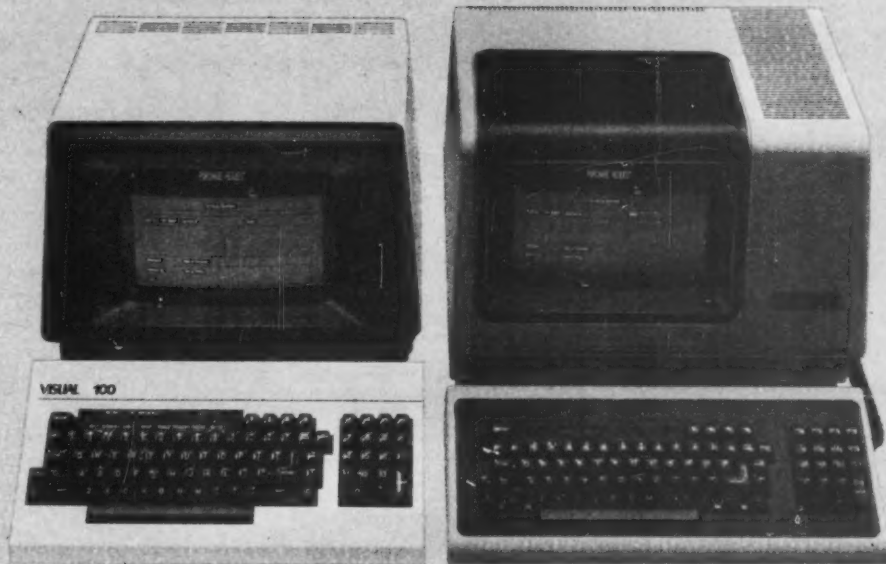
## Comten User Meet Set For Houston Oct. 6-10

HOUSTON — CUE XV, a user-oriented computer convention sponsored by Comten Users Exchange, Inc., is scheduled to take place here Oct. 6-10.

The agenda includes sessions on performance measurement systems, NCR-Comten's data communications networking perspective, tech control systems, Software Release 63 with CNS trunking protocol alternatives, Comten NTO support and Remote MAF.

The fee is \$150 for the whole week or \$75 for Thursday-only admission. Detailed information is available from Marilyn Cianciolo, General Motors Research Labs, GM Technical Center, Warren, Mich. 48090.

# Freedom of choice.



## VISUAL 100

These two terminals not only look alike—they act alike. But ours is a little better.

The new VISUAL 100 is 100% compatible with the DEC VT 100, right down to the spacing of the keys and the roll of the keyboard. Neither your operator nor your software will know the difference. Except your operator will appreciate the superior human engineering features of the VISUAL 100 like the non-glare screen,

adjustable viewing angle and low slung keyboard.

Further, the Advanced Video package and current loop interface that are optional with the DEC® terminal are standard with the VISUAL 100. And we've added an optional Buffered Printer Interface with independent baud rate, independent parity and printer busy via XON/XOFF protocol or control line.

Although we think the VISUAL

## Digital VT 100®

100 is a little better than the VT 100®, we priced it a little lower. Plus it's from the Company that's delivered thousands of terminals emulating DEC, Hazeltine, Lear Siegler and ADDS. Call or write us today.

**VISUAL** See for yourself

Visual Technology Incorporated  
Railroad Avenue, Dundas Park, Andover, MA 01919  
Telephone (617) 475-8088

## Managers on the Move



Richard Sigrist

RICHARD D. SIGRIST has been appointed manager, information systems, Analog Devices' Instrument and Systems Group in Norwood, Mass. He will direct the design and implementation of management information systems, as well as maintain financial control over operational costs.

Prior to the promotion he was a systems analyst at Analog. Sigrist joined the company in 1967. He has been employed in supervisory engineering positions with MIT, General Motors and ITT-Kellogg.

Sigrist has a B.S. degree from the University of Illinois and an M.S. in industrial management from Northeastern University.



Frances L. Chu

FRANCES L. CHU, department head of systems integration services for Chemical Bank, New York, has been named vice-president. She will be responsible for providing data base services, distributed and time-sharing systems services and office automation services.

Prior to joining Chemical as an assistant vice-president in 1973, Chu was an advisory marketing representative for IBM.

LEONARD H. FROEMEL will join SCI-PRO, Inc. as vice-president of operations. He is responsible for the design, development and production of hardware/software for SCI-PRO's transition from research and development to manufacturing operations.

Prior to the appointment Froemel was manager of manufacturing at Hazel-

tine Corp. He has held senior manufacturing engineering and operations positions with Applied Digital Data Systems, Lux Corp. and Viewlex, Inc.

...

JAMES E. HUGHES has been appointed branch manager of Xerox Computer Services for Wisconsin, Minnesota and upper Michigan. He has been affiliated with Xerox since 1973, most recently as marketing manager of the Milwaukee branch.

Prior to joining the company, Hughes was vice-president of manufacturing, Zimmerman Brush Co.; director of information systems, Pettibone Corp.; and held programmer and systems analyst positions for Zenith Radio Corp. and Admiral Corp.

Hughes received his B.A. degree in mathematics and economics from Ripon College, Wisconsin.



C. Miles Fort Jr.

C. MILES FORT JR. has been named director of staff services for Libbey-Owens-Ford Co.'s management information services department. He will be responsible for system design and development, communications and time-sharing services, material coding, DP form design and control and evaluation of computer hardware and software packages.

Fort was a senior systems analyst before his promotion. He joined the company in 1941 holding posts at the company's Shreveport, La., glass plant before transferring to the executive office in Toledo, Ohio, in 1971.

He received a B.A. in business administration from Centenary College in Shreveport.

...

FREDERICK S. WOLFE has been promoted to director of management information systems (MIS) for the St. Regis Paper Co. He will be responsible for designing and operating all of the company's computer systems.

Wolfe joined St. Regis in 1960 as a management trainee in the Flexible Packaging Division's Columbus, Ohio, plant. He was named the division's DP manager five years later and, in 1969, entered the corporate MIS department as manager of the Dallas regional computer center. In 1977, he was named manager of MIS operations and information systems.

He received a B.B.S. degree in industrial engineering from Ohio State University.

DAVID H. BUTTERFIELD has been named director of information resources for Prime Computer, Inc., Wellesley Hills, Mass. He will direct planning, developing, maintaining and operating Prime's internal business and office systems.

Before joining Prime, he was director of systems at Gillette Corp. and prior to that held various sales, marketing management and consulting positions with IBM.

Butterfield received a B.S. degree in

industrial management from MIT and an M.B.A. degree from Washington University in St. Louis.

...

JOHN A. MARAGANIS has joined Data, Inc., a Burlington, Mass., consulting firm, as director of the information services division. He will be responsible for managing software projects, computer operations as well as being a technical consultant for the company.

# Do the

# 1

## CALL

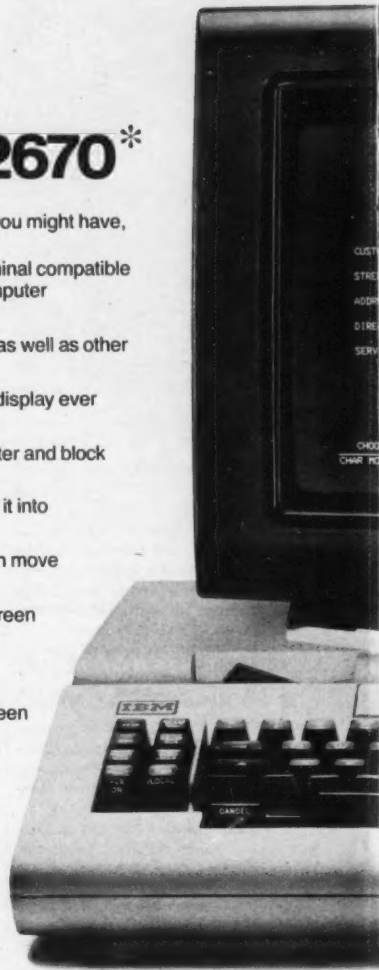
## 800-431-2670\*

First you ask us any questions you might have, such as these:

1. Is the IBM 3101 Display Terminal compatible with both IBM and non-IBM computer systems?
2. Can I use it for time sharing as well as other remote computing services?
3. Is this the most economical display ever offered by IBM?
4. Does it come in both character and block transmission models?
5. Can I easily set it up and put it into operation by myself?
6. Is it light enough so that I can move it around?
7. Can the 12-inch diagonal screen be swiveled or tilted to cut interference from overhead lighting?
8. Can I switch quickly from green characters on a black background to black on green?
9. Is it simple to change line speed, parity, scroll, and other functions?
10. Is there a printer available to capture a hard copy of what I see displayed?

\*In New York call 800-942-1918.

## The IBM 3101 ASCII terminal, priced





## Managers on the Move

He is a graduate of New Hampshire College, with a B.S. degree in management information systems.

...

MARK G. HURWITZ has been appointed manager, DP operations for the Sheraton Corp. Hurwitz will be responsible for computer operations, data control and data entry.

Prior to joining Sheraton, he was associate director of administrative computer services at Northeastern University.

sity.

He holds a B.A. degree in economics and an M.Ed. degree in administration from Northeastern.

...

EUGENE BOYER has been named director of business and finance at the University of New Mexico Hospital/BCMC in Albuquerque. Prior to the appointment, he was director of DP at the hospital.

Before joining the hospital staff in

1979, he was a partner in Jeffrey L. Walker & Co. in San Francisco. Formerly he was a senior systems analyst with International Harvester Co. in Chicago and later joined Arthur Young & Co. in Los Angeles as a manager of its management service consulting practice.

...

The Pryor Corp. has promoted DENNIS S. OLES, manager, computer operations. He will be responsible for all

computer operations in the supply and services divisions.

Prior to the appointment, Oles was senior programmer. He joined Pryor in 1974 as a programmer/analyst.

...

ANDREW NICHOLS III has been named manager, information processing services, for the corporate DP department of Rexnord, Inc., Milwaukee. He is responsible for computer operations, key entry and data control.

# ASCII two step

# 2

## SEND THIS ORDER FORM

When you mail us this form you can get delivery within 45 days.

IBM Data Processing Division  
National Marketing Center, Dept. 86-R  
1133 Westchester Avenue  
White Plains, NY 10604



Yes, I wish to order IBM 3101 Displays and IBM 3102 Printers specified below for delivery as soon as possible. I understand that a 15-day trial is available for the first five IBM 3101's and the first five IBM 3102's only, and that this offer, including the prices shown below, is subject to change without notice until order confirmation. I have read and signed the Outline of Terms of Purchase on the reverse side.

| QUANTITY                                   | INTERFACE                                | UNIT PRICE* |
|--|--|-------------|
| <u>IBM 3101 Display - Character Models</u> |  |             |
| ___ Model 10                               | RS-232C point to point                   | \$1295      |
| ___ Model 12                               | RS-232C point to point/20MA current loop | \$1320      |
| ___ Model 13                               | RS-232 & RS-422 point to point           | \$1320      |
| <u>IBM 3101 Display - Block Models</u>     |  |             |
| ___ Model 20                               | RS-232 point to point                    | \$1495      |
| ___ Model 22                               | RS-232 point to point/20MA current loop  | \$1520      |
| ___ Model 23                               | RS-232 & RS-422 point to point           | \$1520      |
| ___ Model 01                               | <u>IBM 3102 Printer</u>                  | \$1295      |
| <u>ACCESSORY</u>                           |  |             |
| ___  | Modem Cable                              | \$65        |

\*Volume discounts available. Prices shown exclude applicable taxes and shipping charges.

See reverse for Outline of Terms of Purchase ▶

Name and Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Ship to: (if different)

Name & Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

as low as \$1,295. Give it a try for 15 days.



# Network Keeps Landscaping Dealer Posted

PORTLAND, Ore. — At Alfred Teufel Nursery, Inc., a West Coast wholesaler of nursery products and landscaping supplies, several hundred over-the-counter orders per day result in instant invoices, instant customer account posting and instant inventory updates.

"We're among the 10 largest nurseries on the West Coast, and I believe in having up-to-the-minute information," Tom Teufel, vice-president of the family-owned corporation, said. "I think our invoicing operation is

unique in our industry."

At the Portland nursery and its branch in Seattle, over-the-counter orders are keyed on CRT terminals on-line to a mainframe. Following credit checks, the computer sends back invoice header data, line item extensions, totals and discount data for immediate output on printing terminals and presentation to the customer.

At the same time, the computer updates inventory files, handles account posting and — when appropriate — generates purchase orders for replen-

ishing inventory.

The company, formed four generations ago by Gustav Teufel, supplies more than 3,000 landscaping, building and gardening customers across the nation with over 15,000 items ranging from pine trees and rhododendrons to gardening tools and fertilizers. The company sells on a wholesale basis only.

The nursery is located on 100 acres used to grow holly, pine, maple, spruce and a number of other trees, as well as a variety of shrubs. The Seattle branch is located on 20 acres that is also used for stock and growing products. Teufel said the Burroughs Corp. B1855 in Portland is on-line to the Seattle branch via data sets and full-time leased lines to a second AP 310 printing terminal and a number of TD 830 CRT terminals.

The B1855, together with a network of TD 830 CRT terminals, also handles all transactions related to the company's accounts payable and receivable applications.

## Expansion Planned

The company intends to expand use of the B1855 in the near future to handle payroll applications and to institute two new inventory control systems to monitor hard goods supplies. According to Teufel, the B1855 presently han-

dles inventory systems for out-of-state orders, local orders and future orders. The company will institute controls for tool and fertilizer inventories, bringing the total number of inventory items managed by the computer to 35,000.

The nursery has been using Burroughs equipment and software since 1968, when it first entered data processing using a Series L3000 minicomputer. The L3000 was replaced by a B800 computer in 1977; the nursery purchased the B1855, valued at approximately \$145,000, last October because it wanted a system that has full audit and recovery capabilities while being able to manage an extensive on-line terminal network.

"Burroughs equipment has always performed well for us. It is very reliable and easy to use. In fact, our main computer operator used to work as a shipping dock foreman with no previous computer experience," Teufel noted.

The B1855, which has 512K bytes of main memory and 65M bytes of expandable disk pack storage, is using a number of Burroughs program products. These include Network Definition Language, Message Control System (MCS), Data Management System II, Data Management System Inquiry and the Command and Edit language.

## IT'S EVEN EASY TO READ THE FINE PRINT

### Outline of Terms of Purchase. IBM 3101 and IBM 3102 Machines.

#### PRICES & TERMS

The prices shown on the order form on the reverse side (Order Card) and these terms are subject to change until IBM confirms your order in writing (order confirmation). At that time, you will be given the full terms governing this purchase including any changes to the prices and terms shown here. In the event of any change, you may cancel the order within 10 days without liability by written notice to the DPD Marketing Center. Otherwise, the prices and terms provided at the time of confirmation will apply to this order.

Payment is due 15 days after the Date of Installation. The Date of Installation of the machines is deemed to be two days after the date of receipt by the Customer. In addition to the purchase price of the machine, the Customer agrees to pay all applicable taxes and shipping charges.

#### INSTALLATION

The Customer is responsible for unpacking, checking out and setting up these machines.

#### TITLE AND RISK OF LOSS OR DAMAGE

The title to each machine passes to the Customer on the Date of Installation. Up to and including the Date of Installation, the risk of loss or damage will be borne by IBM. Thereafter, risk of loss or damage will be borne by the Customer.

#### 15-DAY TRIAL

The Customer may order the first five IBM 3101's and the first five 3102's on a 15-day trial basis. If, for any reason, the Customer is not satisfied with these machines, the Customer may return the machines and pay only shipping charges to the Customer's location. To return the machines, the Customer must notify the DPD National Marketing Center within 15 days from the Date of Installation and pack the machines in their original shipping cartons. IBM will arrange for their return to IBM.

#### WARRANTY

IBM warrants that each machine will be in good working order on the Date of Installation and that it will conform to IBM's official published specifications.

For three months commencing on the Date of Installation of each machine, IBM agrees to provide at no additional charge to the Customer, warranty service at an IBM Repair Center to restore the machine to good working order.

DETAILS OF THIS WARRANTY, AND EXCLUSIONS FROM WARRANTY SERVICE, WILL BE PROVIDED AT THE TIME OF ORDER CONFIRMATION.

#### SHIPMENT

IBM will provide the estimated shipment schedule for this order in writing at the time of order confirmation. IBM reserves the right to amend the estimated shipment schedule as necessary.

INFORMATION ON PATENT INDEMNITY, LIMITATION OF REMEDIES AND OTHER GENERAL PROVISIONS WILL BE PROVIDED AT THE TIME OF ORDER CONFIRMATION.

I have read the above and understand that my order is subject to prior credit approval, that the full terms governing my order will be sent with IBM's confirmation letter and, that unless notified otherwise, shipment will be made within 45 days of receipt of order.

AUTHORIZED SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
NAME (Please print or type) \_\_\_\_\_ PHONE \_\_\_\_\_



## Air Canada Loading System Gives Vital Preflight Calculations

NEW YORK — In an effort to obtain better fuel efficiency and more streamlined service, Air Canada is introducing its Automated Load Planning System (Alpac) to 10 of its 12 Caribbean stations.

The system was designed to help load agents ensure that an aircraft's luggage and cargo are balanced as evenly as possible before each takeoff. That process is a delicate one and must be kept within established limits.

Previously calculated by hand using charts, forms and graphs, the job has been performed with the use of a computer keyboard since July — much to the approval of load agents, according to Air Canada.

### System Features

Alpac works hand-in-hand with the automated flight planning computer so that total fuel load and individual tank requirements can be established.

With the system, all information on boarding freight can be input directly

from the flight terminal and all load-message information to the succeeding station can be collected and automatically transmitted to the next station. Passenger load information can also be automatically input at stations which are equipped with the automatic seat-selection device.

If the projected load plan goes beyond limits, the computer will refuse the input, and the agent is referred back to the point at which he must start replanning the load.

This system of surveillance and alert remains in place until the final figures are collected and given to the captain of the aircraft.

"The process has been accepted by all load agents as being very important to the accomplishment of optimized trim," reported Barry Blight, Air Canada's aircraft services manager for the U.S. and Southern Region.

"It is also looked upon as an important technological advancement in the industry," he added.

## Group Ready for 370 on a Chip

MT. SHASTA, Calif. — Mokurai Cherlin of APL Business Consultants, Inc. believes the long-awaited single-chip computer with the IBM 370 instruction set is just over the horizon, so he has formed Group/380, an interest group that gathers information that will help people figure out what to do with the new system when it arrives.

Cherlin claims there are no serious problems left in developing such a system. He cited *Datamation* report stating that IBM, Intel Corp. and Motorola Corp. have already put

the 370 instruction set on a chip. It is now only a question of waiting for it to go into production.

His group's initial plan is to prepare the way for 370-compatible micros by accumulating all relevant information. The software data base is thought to be the most important part of this preparation.

Membership in Group/380 is \$10 for individuals and \$25 for corporations and groups. More information is available from APL Business Consultants, Inc., P.O. Box 1131, Mt. Shasta, Calif. 96067.

**"The federal government has indicated that factory and office productivity are declining—contributing not only to inflation, but to a weakening of our competitive strength in the world market as well."**

## Are you aware that declining productivity is quickly becoming one of our nation's biggest problems?

**Find out about this important issue, and what you as an information specialist can do to improve productivity within your own organization.**

Plan to attend

### International Data Corporation's Fall Executive Conference

#### Improving Information Processing Profitability and Productivity in the 1980's

October 19-22, 1980—Hotel del Coronado, San Diego

##### Sunday, October 19th

###### Early Bird Session!

A panel discussion made up of leading technologists from the semi-conductor, software, systems, and input/output areas will bring Conference Attendees up to a common level of knowledge regarding technology's contribution to improvement in productivity of computer and office systems.

##### Monday, October 20th

###### The Dimensions of the Productivity Problem and Possible Hardware Solutions

Kicking things off will be the day's KEYNOTE SPEAKER, Dr. John Hagan, Vice President, Research, American Productivity Center—an organization devoted to improving U.S. business and organizational productivity. Dr. Hagan will inform Conference Attendees on where the U.S. fits in the productivity spectrum; how MIS can contribute to better productivity and how to identify productivity bottlenecks within your organization.

Other topics/speakers for the day:

**Managing Information Resources for Greater Productivity**—Barry Stevens, Performance Management Associates, Editor, "EDP Performance Handbook."

**Leading User Experiences**—Len Shea, President, Computer Resources Management.

**PANEL DISCUSSION: Hard Versus Soft Productivity**

- Chairman, Will Zachman, Research Director, Information Systems Planning Service, IDC
- Software vendor (Boole & Babbage)—to be announced
- Hardware vendor—Asa Lorum, Vice President Software, Amdata

**PANEL DISCUSSION: Comparing Large Mainframe, Mini or Distributed Productivity**

- Ray Smith, Senior Vice President, Microdala
- Vaughn Hysinger, Director, Software Support, Four Phase Systems

**Programming Productivity Enhancements**—Dr. Keith Unrapp, USC Information Science Institute.

**Capacity Management & Planning**—Diane Fazel, Director of Marketing, Institute for Software Engineering.

**SPECIAL FEATURED SPEAKER: Improving Productivity Through Systems Planning**—John Zachman, Industry Consultant, IBM Corporation.

##### Tuesday, October 21st

###### The People Problem: Improving Productivity via Human Resource Management

KEYNOTE SPEAKER for this day's session will be Ira Gottfried, the well-known MIS consultant from Los Angeles. Mr. Gottfried, who has his own consulting organization, is a specialist in internal planning and human resource management. He'll describe how the "new breed" EDP professional differs from the old style DP pioneers; how this affects the selection process; and the career paths open to DP professionals in the 1980's.

Other discussions for the day to include:

Dr. Robert A. Zawacki, Associate Professor, University of Colorado, and Dr. Dan Cougar—co-authors of a new study on "Personal Development and Productivity Improvement in DP".

**Improving Application Software Quality**—Wayne Smith, Vice President, Applied Information Development, Inc.

**WRAP-UP SESSION** by Dr. Werner Frank, Executive Vice President, Informatics. Dr. Frank, one of the pioneers of the software industry, will examine

**"The New EDP Economics: People/Software Tradeoffs."** One of the main thrusts of his presentation will be a look at the growing packaged software industry as an alternative to expensive in-house development.

##### Wednesday, October 22nd

KEYNOTE SPEAKER for the final day's sessions will be Kent Black, President of Rodwell Corporation's Electronic Systems Division. Mr. Black will spell out what a chief executive expects from the information systems professional in the 1980's: how "friendly systems" are allowing top executives to interact directly in information processing; and how top managers can make more productive use of their own time.

Other presentations will include:

**PANEL DISCUSSION: Building Systems More Friendly to the User in Office Administrative Environment and More Economical to MIS.**

- Chairman, Thomas Snagop, Director, Automated Business Communications Program, IDC
- Lawrence Burden, Director, MIS Services, Northwest Industries
- Vendor Discussion—Bob Bond, Marketing Manager, Hewlett-Packard 3000 Series

This Conference, one of two IDC conducts each year, will look at the productivity problem from the standpoint of the information resources manager. While computer and office systems can go a long way toward improving productivity, careful planning of all the resources at hand—systems, people, and procedures—is absolutely necessary for success. Presentations by top vendors and leading-edge users will provide IDC Conference Attendees with insights on new products (both hard and soft), information on new technologies, and examples of successful case histories.

### Cost and Registration Procedure:

The Conference registration fee is \$750. Additional persons from the same organization may attend at the reduced rate of \$495. For a complete registration packet, contact the IDC Conference Coordinator—and use our toll-free number: **800-225-8952**.

### Send for Full Information About This Important Conference

### Back-to-Back Conferences at No Additional Charge!

In early June, IDC acquired LINK Resources Corporation of New York, market research specialists covering the new channels of delivery for information into the home and office. LINK will be conducting a Conference, entitled "The New Electronic Media," at the del Coronado immediately following the conclusion of the IDC program. The LINK Conference will begin on Wednesday afternoon, October 22nd and run through Friday, October 24th.

Anyone attending the IDC Executive Conference is invited to stay for all or part of the LINK program at no extra charge. If time is tight, please consider staying for just the Wednesday afternoon session, which will offer a general overview of the new electronic media. Demonstrations will include: video disks, online data bases, the Source, personal computers, etc. If you would like more information about LINK—the Conference program, or their product line—contact the IDC Conference Coordinator at **800-225-8952**.

International Data Corporation  
P.O. Box 915  
Waltham, MA 02254  
Attn: Conference Coordinator  
800-225-8952

|              |     |
|--------------|-----|
| Name         |     |
| Title        |     |
| Organization |     |
| Address      |     |
| City         |     |
| State        | Zip |
| Telephone    |     |



# Hamming's Technique Of Error Correction Marks 30th Birthday

MURRAY HILL, N.J. — It was simple human frustration that led Dr. Richard W. Hamming, then a research mathematician at Bell Laboratories, to devise the first method for correcting machine-caused errors in digital computers back in 1950.

Hamming's technique — a result of his research in pure mathematics — enabled computers to spot electrical errors in the data and instructions and tell where they occurred. And, for the first time, it enabled computers to correct those errors and go right on solving problems without interruption.

This year marks the 30th anniversary

of Hamming's development of error-correcting codes. Besides aiding the computer industry, the codes are also essential to call-processing accuracy in the Bell System's No. 1 ESS (electronic switching system).

## Early Frustration

Hamming's frustration came about because early computers would simply stop operating whenever they detected an error.

"I knew that if the computer was smart enough to detect an error and shut itself off to prevent false answers to the problem, then it could be made smart enough to correct that



Thirty years ago, at switchboard of apparatus (left), whose mathematical research made the that enabled computing machines to correct apparatus possible, and Bernard Holbrook, under their own mistakes, are Richard Hamming der whose direction it was built.

error and continue computing," Hamming recalled recently.

In time, Hamming devised a method using a combination of several odd-even checks to identify precisely the position of the error and make the correction. Apparatus incorporating Hamming's mathematical discovery was constructed under the direction of Bernard D. Holbrook, then a Bell Labs switching research engineer.

In the early days of computers, errors usually were caused by faulty relay contacts, open circuits, false grounds or disturbances induced by outside sources. Today, even with the advent of solid-state components, extraneous signals still find their way into the individual transistors and other electronic devices to cause potential errors.

The error-detecting and -correcting capabilities of Hamming's codes are provided as part of the processor hardware of the Bell System's No. 1 ESS.

At year-end 1979, there were more than 900 such systems across the country serving almost 19 million customer lines. Hamming codes are also used in Bell System electronic tandem switches and in electronic long-distance operator consoles.

## Effectiveness Shown

The effectiveness of Hamming's codes was demonstrated during the 1960 trial of the world's first ESS at Morris, Ill. A small piece of wire fell across two terminals of one program memory while the duplicate memory was out of service. This resulted in the possibility of 33,000 call-processing mistakes per second.

It took Bell maintenance personnel nearly an hour to find the tiny wire. However, not a single call was misdirected because Hamming's codes auto-

matically corrected each of the thousands of errors the machines made each second.

## Bell Retiree

Hamming joined Bell Labs in 1946, specializing in the use of numerical methods for solving problems on large-scale computing machines. A Bell Labs retiree, Hamming now teaches mathematics and computer science at the Naval Post-Graduate School in Monterey, Calif.

He is past president of the Association for Computing Machinery (ACM) and in 1968 was elected Turing Prize Lecturer of the ACM. In 1979, he received the Piore Award of the Institute of Electrical and Electronics Engineers.

Hamming was recently elected a member of the National Academy of Engineering. His latest book, entitled *Coding and Information Theory*, was published this year by Prentice-Hall, Inc.

Delivery in 30 days or less!

## Q310 TERMINAL SYSTEMS

Univac U200/UTS400 Modes  
Options include:

Multi-Page Memory — Allowing local storage of screen data

Multi-Line — Our unit can access multi CPU's — or one CPU and receive multi-programs

Multi-Port, Multi-Address, and MORE!

The stand-alone units can be custom designed to fit your individual needs!

### CONTACT:

**The Computer Place**  
4595 Van Epps Road  
Brooklyn Heights, OH 44131  
216/351-7444

"See a demo unit at the meeting in Dallas"

**IBM 3101**  
TTY Compatible  
CRT

**1 year  
rental  
\$56<sup>00</sup>/Mo.**  
(California only)



**IMMEDIATE AVAILABILITY  
PURCHASE PRICE \$1195.00**  
(Limited Offer)

## IN STOCK

|   |        |
|---|--------|
| VISUAL 200 [VT52, ADDS, ADM3, HAZELTINE]      | \$ 995 |
| VISUAL 210 [PROG. FUNCTION KEYS]              | 1,095  |
| VISUAL 100 [COMPATIBLE W/DEC VT-100]          | 1,695  |
| MICROTERM MIME 2A [VT52, SOROC, HAZELTINE]    | 895    |
| MICROTERM ACT 5A [SMART EDITING, SPUT SCREEN] | 845    |
| MICROTERM MIME 314 [ADM 3, HAZELTINE, ACT IV] | 775    |
| MICROTERM MIME 100 [COMPATIBLE W/DEC VT-100]  | 1,595  |
| DATASOUTH DS180 [180 CPS MATRIX PRINTER]      | 1,395  |
| 212A MODEM [BELL COMPATIBLE]                  | 825    |

**QUANTITY DISCOUNTS  
AVAILABLE.  
CALL (213) 999-2281**

**PMS**  
Pacific Mountain States  
CORPORATION

**htc**

**henrich technical consultants**  
COMPUTER APPLICATIONS SERVICES  
SYSTEMS DEVELOPMENT  
PROJECT MANAGEMENT  
TRAINING SEMINARS

P.O. Box 308  
Newtonville, Ma. 02160  
(617) 894-8591

18257 Shepley Place  
Northridge, Ca. 91326  
(213) 363-0104



- ☒ Save you thousands of dollars
- ☒ Deliver quickly
- ☒ Take trade-ins

System/34, System/32,  
System/3, All peripherals and  
upgrades too.



Cass Marketing Services Inc., 535 N. Brand Blvd.,  
Suite 838 Glendale, CA 91203 • (213) 956-4982

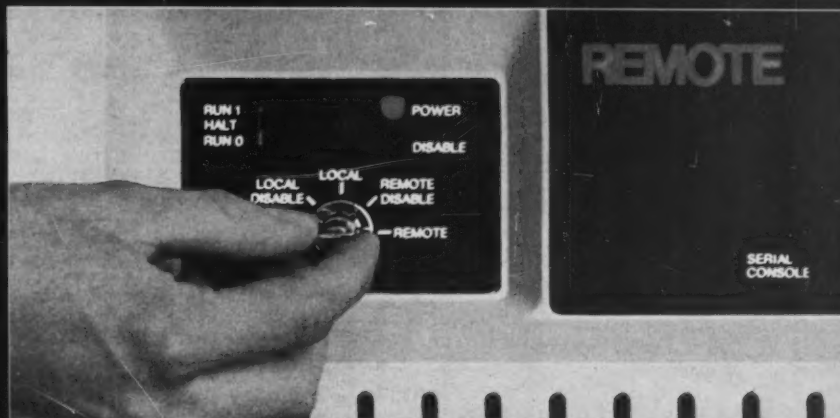
## INSTANT HAPPINESS RECIPE FOR CICS USERS

- 1 shopfull online applications
- 1 packet X.25
- 1 remote CICS network
- Add VTAM, TCAM, BTAM to taste
- 3704s, 3705s, COMTEMS optional
- Pinch of SNA for the daring

Combine ingredients with 15 minute installation of **CTOP**, the CICS Transmission Optimizer. Watch for reduced response time, increased print speeds, and happier CICS users

**INFORMATION CONCEPTS, INCORPORATED**  
One Dallas Center, Suite 1750, Dallas, Texas 75201  
(214) 324-2635

# DIGITAL PRESENTS A MAJOR ATTACK ON DOWNTIME.



*In "Remote" mode, your computer is linked to our Diagnostic Center in Colorado Springs.*

---

**Day or night, Digital's computer-to-computer Remote Diagnosis  
▶ ▶ ▶ ▶ ▶ goes into action within 15 minutes of your call. ◀ ◀ ◀ ◀ ◀**

---

At Digital, we know that your tolerance of computer downtime is very low.

So is ours.

That's why we've developed computerized Remote Diagnosis,\* the first of its kind.

When a Digital system has a problem, a toll-free phone call and the simple flick of a switch launch a coordinated effort to get that system up and running as soon as possible. Within 15 minutes, our Remote Diagnosis computer in Colorado can run a troubleshooting program on your system via a voice-grade phone link. If we have to send service representatives, we send them prepared. Remote Diagnosis lets them know exactly what's wrong and what they need to fix it before they arrive on the scene.

During off-peak hours, we can run a preventive maintenance program that won't interfere with normal use. Done regularly, Remote Diagnosis

goes beyond troubleshooting. It pinpoints potential problems while they're still merely potential.

We take a lot of pride in the way our computers perform. And we take it very personally when they don't. So we'll keep looking for new ways to serve you better and hold maintenance costs down.

At Digital, the war against computer downtime is never over.

Write: Digital Equipment Corporation, Field Service Marketing Communications, PK3-2/S25, 129 Parker Street, Maynard, MA 01754.

\*Available on: VAX-11/780, PDP-11/70, PDP-11/44, DECsystem-10 and DECSYSTEM-20, DEC Datasystem 570 and DEC Datasystem 540.

**digital**

## Calendar

Sept. 30 - Oct. 1, Pittsburgh, Pa. - **User's Guide to Systems Development.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20014.

Oct. 6-9, Tokyo - **Eighth World Computer Congress.** Contact: Afips, 1815 N. Lynn St., Arlington, Va. 22209. Also being held Oct. 14-16 in Melbourne, Australia.

Oct. 5-10, Anaheim, Calif. - **Meeting of the American Society for Information Science (ASIS).** Contact: ASIS, 1010 16 St. N.W., Washington, D.C.

20036.

Oct. 6-7, Minneapolis - **Conference on Local Computer Networks**, sponsored by the Institute of Electrical and Electronics Engineers. Contact: Dr. Abe Franck, USS: University of Minnesota, 227 Experimental Engineer, 208 Union St. S.E., Minneapolis, Minn. 55455.

Oct. 6-7, San Francisco - **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville,

Md. 20854.

Oct. 6-7, San Francisco - **Software Cost-Estimating.** Contact: Data Processing Management Association Education Foundation, 505 Busse Highway, Park Ridge, Ill. 60068. Also being held Oct. 27-28 in Los Angeles.

Oct. 6-7, New York - **How to Sell Data Processing Products and Service More Effectively.** Contact: New York University Management Center, 360 Lexington Ave., New York, N.Y. 10017.

Oct. 6-8, Chicago - **Data Communications: Effective Network Design.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Oct. 29-31 in Chicago.

Oct. 6-8, San Francisco - **Automating Your Office Today: Planning and Implementation Methods.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 6-10, Newport Beach, Calif. - **Structured Systems Analysis and Design.** Contact: Improved Systems Technologies, Inc., Suite 4500, 888 Seventh Ave., New York, N.Y. 10106. Also being held Oct. 20-24 in Chicago.

Oct. 8-10, Washington, D.C. - **Introduction to Micro/Personal Computer: Applications, Selection and Usage Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Oct. 20-22 in Los Angeles.

Oct. 9-10, Chicago - **Midwest User's Group Meeting**, sponsored by Nixdorf Computer Software Co. Contact: Computer Software Co., 6517 Everglades Drive, Richmond, Va. 23225.

Oct. 6-10, Houston - **Structured Data Base Design.** Contact: Improved Systems Technologies, Inc., Suite 4500, 888 Seventh Ave., New York, N.Y. 10106.

Oct. 6-7, Syracuse, N.Y. - **Successful Selection of Minicomputers**, sponsored by the Canadian Institute of Charter Accountants. Contact: RHY Consultants, Inc., P.O. Box 21026, St. Paul, Minn. 55121. Also being held Oct. 20-21 in San Francisco.

Oct. 6-7, Washington, D.C. - **Basic Data Communication.** Contact: Atlantic Research Corp., 5390 Cherokee Ave., Alexandria, Va. 22314.

Oct. 6-7, Philadelphia - **Microprocessing for Managers.** Contact: American Institute for Professional Education, Carnegie Building, Hillcrest Road, Madison, N.J. 07940. Also being held Oct. 20-21 in Los Angeles.

Oct. 6-8, Topeka, Kan. - **Structured Systems Design User's Conference.** Contact: Langston, Kitch and Associates, Inc., 715 E. 8 St., Topeka, Kan. 66607.

Oct. 6-8, Seattle, Wash. - **Data Communications Network Design.** Contact: Institute for Science and Public Affairs, 1370 Ave. of the Americas, New York, N.Y. 10019.

Oct. 6-8, Los Angeles - **Inquiry IV/IMS User Group Meeting.** Contact: Informatics, Inc., 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Oct. 6-8, Washington, D.C. - **Configuration Management.** Contact: George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

Oct. 6-8, Hartford, Conn. - **Computer Controls.** Contact: RHY Consultants, Inc., P.O. Box 21026, St. Paul, Minn. 55122. Also being held

Oct. 27-29 in Honolulu.

Oct. 6-8, Chicago - **U.S. Independent Telephone Association (Usita) Conference.** Contact: Usita, Suite 1201, 1801 K St. N.W., Washington, D.C. 20006.

Oct. 6-8, Toronto - **APL Users Meeting.** Contact: I.P. Sharp Associates Ltd., 145 King St. W., Toronto, Ont., Canada M5H 1J8.

Oct. 6-9, New York - **CICS/VS Application Design.** Contact: On Line Software International, 65 Rt. 4 E., River Edge, N.J. 07661.

Oct. 6-9, Boston - **Senior Project Management.** Contact: American Management Associations, 135 W. 50 St., New York, N.Y. 10020. Also being held Oct. 27-30 in Los Angeles.

Oct. 6-9, Anaheim, Calif. - **Computer-Aided Design & Manufacturing.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

Oct. 6-9, New York - **Information Management Exposition and Conference.** Contact: Clapp & Poliak, Inc. 245 Park Ave., New York, N.Y. 10017.

Oct. 6-10, Orlando, Fla. - **Sperry Univac's Series 1100 User Meeting.** Contact: USE, Inc., Box 461, Bladensburg, Md. 20710.

Oct. 6-17, Tokyo and Melbourne, Australia - **International Federation of Information Processing Societies (IFIP) Congress 80.** Contact: IFIP Congress 80, G.P.O. Box 880G, Melbourne, Victoria, Australia, 2001.

Oct. 7, Boston - **Data Catalogue Update.** Contact: Synergetics Corp., One De Angelo Drive, Bedford, Mass. 01730.

Oct. 7-9, Houston - **Managing the DP Professional - the Challenge of the '80s.** Contact: UBI Enterprises, 30 Milbank Ave., Greenwich, Conn. 06830.

Oct. 7-9, Mayaguez, Puerto Rico - **Financial Planning and Control in the Small and Medium-Sized Business.** Contact: Arthur Andersen & Co., Center for Professional Education, 1405 N. Fifth Ave., St. Charles, Ill. 60174.

Oct. 7-9, Hong Kong - **Advanced Auditing.** Contact: Arthur Andersen & Co., Center for Professional Education, 1405 N. Fifth Ave., St. Charles, Ill. 60174.

Oct. 7-9, Los Angeles - **Introductory APL.** Contact: STSC, Inc., 11 Clearbrook Road, Elmsford, N.Y. 10523. Also being held Oct. 7-10 in Madrid, Spain.

Oct. 7-9, Philadelphia - **Project Management & Control.** Contact: Q.E.D. Information Sciences, Inc., 180 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

Oct. 7-10, San Francisco - **Information Industry Association (IIA) Conference.** Contact: IIA, Suite 502, 316 Pennsylvania Ave. S.E., Washington, D.C. 20003.

Oct. 8-10, Washington, D.C. - **Introduction to Teleprocessing Software.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Oct. 20-22 in Chicago.

Oct. 9-10, San Francisco - **Managing Software Projects.** Contact: Data Processing Management Association Education Foundation, 505 Busse Highway, Park Ridge, Ill. 60068. Also being held Oct. 20-21 in Los Angeles.

### "Let your customers key their own orders".



The P1-5 Data Concentrator permits your customers to remotely key their own orders for your products. It will simultaneously answer up to eight calls and provide immediate storage

on computer diskettes. Your customers may key their orders on a hand held terminal or simply use their push button dial telephone. Call or write for complete information.



Richard Newberry, V.P. Marketing, P.1, Inc.

PHONE 1 • P.O. Box 1522 • Rockford, Illinois 61110 • 815/877-9008

### Don't leave your computer behind.



**Call MTI for immediate delivery of TI's Model 745 Portable Data Terminal. Brings your computer as close as the nearest telephone and standard electrical outlet.**

The **Silent 700\*** Model 745 Portable Data Terminal weighs only thirteen pounds. It's ideal for inventory reporting and control, insurance program planning and much more. TI's Model 745 lets you get the facts on the spot and delivers high quality hard copy at 10 or 30 cps.

MTI is an authorized Texas Instruments distributor and has the 745 ready for purchase or lease at very attractive prices. So, if you want to call your computer anytime, anywhere, call us first. 516/482-3500, 212/895-7177, outside N.Y.S.: 800/645-8016, and in Ohio: 216/464-6688.

\*Trademark of Texas Instruments



Applications Specialists and Distributors

DEC, Hazeltine, Lear Siegler, Dataproducts, Texas Instruments, Teletype, Diablo, Techtran, MFE, Omnicor, Anderson Jacobson, General DataComm, Intel, Cipher, Priam, SMS, Western Peripherals, Able Computer, Elgar and Franklin Electric.

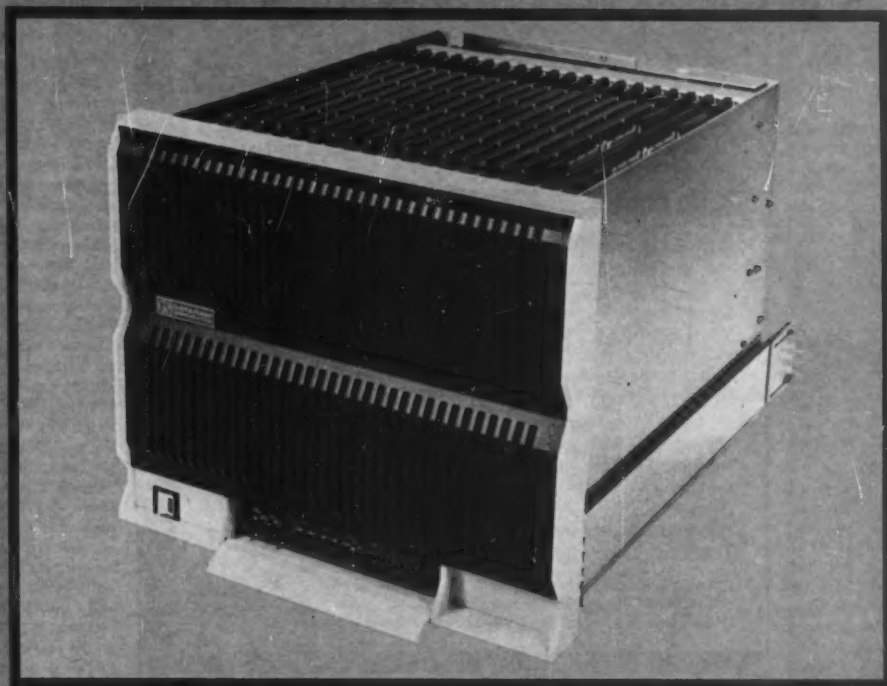
159 Northern Boulevard/Great Neck, New York 11021  
24000 Mercantile Road, No. 7/Beachwood, Ohio 44122



# THE INDUSTRY STANDARD

## BULK CORE

## BULK SEMI



## The choice of hundreds of minicomputer users

Give your minicomputer the added benefit and flexibility of economical, high-capacity storage with BULK MEMORY from Dataram.

The only company to offer both core and semiconductor BULK MEMORY systems for minicomputer users, Dataram today has hundreds of BULK CORE and BULK SEMI users throughout the world, in use in applications that range from process control and data acquisition to disk swapping and main memory expansion. Utilizing capacities from 256KB to 16 MB, and featuring —

- ★ Controllers for DEC, Data General, Perkin-Elmer, and ROLM minis
- ★ Core or semiconductor technology
- ★ Dual-port capability
- ★ Built-in Self Test

BULK MEMORY from the leader. Capability you can use. And only from Dataram. Now.

Find out today how BULK CORE and BULK SEMI can help you get more out of your minicomputer. Contact Dataram at 609-799-0071.



Canada: Ahearn & Soper Ltd., Alberta, British Columbia, Ontario, Quebec • Finland: Systek OY, 737-233, France: YREL, 956 81 42 • Hungary/Poland/Romania: Unifronex Corporation, WARSAW 39 6218 • Italy: ESE s.r.l., 02/6073626 • Netherlands: Technitron B.V., 020-45 87 55 • Sweden: M. Stenhardt AB, (08) 739 00 50 • Switzerland: ADCOMP AG, 01/730 48 48 • United Kingdom: Sintrom Ellnor Ltd., (0734) 85464 • West Germany: O.E.M.-Elektronik GmbH, 07 11-79 80 47 • Australia/New Zealand: Anderson Digital Equipment, (03) 543 2077 • India: Industrial Electronic Instruments, 79281 • Israel: Minix Computers & Systems Ltd., 03-298783 • Japan: Matsushita Electric Trading Co., Ltd., 03 (436) 4501

# In Scientific/Engineering Problem Vector Graphic System B Better Than Average

By Hillel Segal

Although it was one of the least expensive computers benchmark tested so far by the Association of Computer Users, the Vector Graphic, Inc. System B turned in a credible performance. In spite of its low cost, it gave a better than average showing on some tests.

Compared with other computers priced less than \$15,000 tested so far, the System B's time of 19:30.0 in the scientific/engineering problem was about 2% better than the six-system average. In the CPU-intensive test, it scored about 18% better than average.

In the accounts receivable problem, the System B's time of 5:56.5 fell below the group average of 4:15. All tests were run on standard programs written in Basic. The differences in time reflect the relative performance which could be expected under actual working conditions, at least when similar software was used within the Basic environment.

## Qume Printer Included

While the run-times obtained during benchmark testing of the System B are unspectacular, the inclusion of a 55 char./sec Qume Corp. daisy-wheel printer in the total price of \$7,750 is unusual. That component alone sells for about \$3,000, and if a less expensive dot-matrix character printer were substituted, the package price would likely fall below \$6,000, making the System B the most economical small computer tested. In actual practice, a variety of printers are used with the System B. The Qume would normally be included only in a system designed for word processing (WP).

Other elements of the system include a central processor, 64K bytes of memory, two double-sided dual-density 5.25-in. diskette drives, a CRT terminal and the operating system and language. The diskettes are made by Micropolis and store 315K bytes of formatted data each. An additional pair of drives may be added to expand the system to a total of 1.26M bytes.

Because the System B uses a Z80A processor, S-100 bus and CP/M operating system, an almost endless variety of special-purpose circuit boards, languages and applications are available from outside vendors. Vector Graphic also provides quite an array of options, and the System B configuration is intended to present potential users with a practical, low-cost combination.

The processor hardware is housed in a small unit which fits on or under a tabletop. A separate terminal supplied with the package has a conventional 24 line by 80 char. screen. The terminal was noted by users for its high-quality keyboard: "It feels like you're typing on a typewriter, not a computer," one person surveyed remarked.

Those using the Qume printer were happy with the print quality, which approaches that of a good electric typewriter. It offers interchangeable fonts and prints in several pitch settings. But its speed is not equal to that of a conventional matrix printer, and it is much noisier. Vector Graphic now reportedly offers its own 150 char./sec dot-matrix printer, and for most applications other than WP, it would be the obvious choice.

## SCOREBOX

System: Vector Graphic System B  
Current Price: \$7,750

### Series 1 Results\*\*\*

Systems up to \$15,000

|                         | C-1<br>Scientific/-<br>Engineering<br>Time | C-3<br>Accounts<br>Receivable<br>Time |
|-------------------------|--|---------------------------------------|
| Pertec PCC 2000         | 28:48.4                                    | 6:04.3                                |
| North Star Horizon      | 12:01.9                                    | 1:57.7                                |
| Cromemco System Two     | 14:52.6                                    | 2:48.0                                |
| Texas Instruments 771   | 22:05.4                                    | 3:38.1                                |
| Vector Graphic System B | 19:30.0                                    | 5:56.5                                |
| Decstation 78           | To be covered in next issue                |                                       |

### Series 2 Results\*\*\*

Systems \$15,000 to \$25,000

|                            | C-1     | C-3     |
|----------------------------|---------|---------|
| IBM 5110                   | 29:47.2 | 4:11.0' |
| Wang 2200VP                | 2:05.8  | 3:20.0' |
| Texas Instruments FS990/10 | *       | 3:18.6' |
| Hewlett-Packard System 45  | 4:38.9  | 5:05.8  |
| DEC PDP-11V03              | 14:43.4 | 4:14.0  |
| Q1 Lite                    | 6:50.7  | 5:03.3  |
| Univac BC/7-610            | 12:09.2 | 10:37.0 |
| Northern Telecom 405       | *       | **      |
| Datapoint 1170             | 38:27.5 | 6:50.4  |
| Randal 100                 | 13:52.4 | 10:05.0 |
| Hewlett-Packard 250        | 4:05.9  | 4:45.7  |
| Texas Instruments DS990/2  | *       | 2:48.3  |

\*Test could not be run because of memory limitations.

\*\*Test could not be run because of formatting limitations.

\*\*\*Both Series 1 and Series 2 were run on the same programs.

We tested the System B with the CP/M operating system and Microsoft Basic-80, but other combinations are possible. Vector Graphic offers the Mzos and Mdos operating systems by Micropolis. Languages available include C-Basic, M-Basic, Pascal, APL, Fortran, Cobol and assembler.

In addition to these languages, Z80

The Basic-80 language used for the tests has a number of extra features worth noting. It includes several statements of use in structured programming and has the facility to execute Assembly language subroutine calls. This means one can combine Basic with Assembler to speed up execution of frequently-used portions of the pro-

provided.

In checking with customers, the independent consulting firm which performed the benchmark testing found that most systems were being used in a word processing application. Some incorporated the Vector Graphic Memo-rite word processing system, while others had Word Star, Electric Pencil or other standard WP packages. Vector Graphic also supplies a Data Management System besides the WP software. This is the extent of its involvement in customer applications.

## Software Packages

Dealers supply a variety of software packages, including the Peachtree Accounting Packages, a group of five modules ranging in price from \$800 to \$1,000 each.

Few of the customers contacted during the survey were doing their own programming. Most had purchased a turnkey system which was provided along with training, documentation and support. The "personalization" which the System B requires during the setup process was also performed by the dealer.

Factors such as the amount of memory installed, type of printer and so on must be made known to the operating system. Clear documentation is provided to guide the user who wishes to do this himself, but the process does require some technical background.

While there were a few complaints about the suitability of applications software, most customers were very enthusiastic about the System B itself. Despite its low price, some felt it was built better than comparable systems, and one remarked, "The Vector Graphic is the most reliable machine on the market." Low cost and efficient software and repair services were key factors guiding their choice of system.

Next week: the Digital Equipment Corp. Decstation 78.

## About the Author

Hillel Segal is president of the Association of Computer Users (ACU), a nonprofit association with members all over the U.S., Canada and several other foreign countries.

One of the association's key activities is the publication of its "Benchmark Reports." Each month a new report is produced covering another computer system.

In addition, ACU publishes seven bimonthly newsletters for users of small computers, midi computers, large computers, time-sharing systems, distributed processing systems, word processing systems and home and hobbyist computers.

A complete set of sample copies of each of ACU's newsletters and complete information about membership in ACU is available from the ACU at P.O. Box 9003, Boulder, Colo. 80301.

This is the 17th in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports were originally published by the Association of Computer Users, a 4,000-member nonprofit organization.

Disassembler is offered as well, something we have not seen before on a system benchmark tested. With the Disassembler, machine code can be returned to its assembler source form — a reversal of process which comes in handy when the user wishes to modify software for which no source code is available.

## Hobbyist Appeal

This arcane procedure has great appeal to hobbyists and others involved in swapping software which never did get proper documentation, or which was supplied in object-code form originally.

In addition, Basic-80 offers direct execution of statements. Any statement entered without a line number will be executed immediately in conversational fashion.

The program editor supplied with the System B was not as efficient as some we have tested in terms of number of keystrokes required, but the commands were not difficult to learn and use.

Like most Basic editors, it is line-oriented. The user types the line number he wishes displayed, and various commands may be used to move the cursor, insert, delete and so on. No global search-and-replace capability is

# Can Human Interface Be Packaged?

**Q** I am doing strategic system planning for a multinational corporation offering financial services. The theme underlying my plans is one of integration. The system will incorporate a central data base, process automation, process tracking and control, word processing and electronic mail. For medium-range time frame, a nationwide network of distributed minis is planned.

Another theme central to the plan is that the system be "user-friendly." For this reason, I feel rather strongly that the system present a uniform appearance to its user. That is, the user should see and use standard command formats, menus, error messages, screen formats, "Help" messages and so on, regardless of whether they are doing data inquiry or word processing.

The problem is this: I would like to purchase at least part of the software required, but how do I get a uniform human interface? What I need is an OEM software house which provides word processing, electronic mail, and so on that are transaction-driven. Then I can package the human interface myself. Is there such an animal?

**A** Although your intentions are good, it may be impractical to consolidate so many diverse applications. Although hundreds of software houses provide at least part of the systems and applications software support that you require, I know of no single source.

I would be happy to forward responses from software houses who feel they can meet your requirements.

**Q** In your reply to the question of graduate degrees [CW, June 30], you stated (correctly, I believe) that, "No one degree is best for programming." Then you devoted most of the rest of your reply to computer science and information systems degrees. Even the M.B.S. is a Master of Business Science.

One of the biggest problems we face is communicating with users who do not talk in bits, bytes and nanoseconds. These users talk in terms of debits, credits, inventory turns, expense analysis, budget variance and the like. Let's face it, a company can only stay in business if it makes money. Therefore, financial control is very important.

I'm not slighting the other areas of order processing, inventory control, engineering, distribution and service. The point is that the degree should be in business because it gives a good introduction to the broad scope of business management and is particularly useful to the person who has a non-business undergraduate degree. It introduces business terminology and concepts which are invaluable in dealing with a variety of users. The specific detail needed for solving a problem will be supplied by the user.

I recall a situation where a programmer analyst who knew very little about accounting attempted to solve a problem in the area of general ledger. The

accountants knew what they wanted but their proposed solution was a disaster from a DP viewpoint. When the situation was reviewed at the request of the programmer analyst, we worked out a different approach which gave the accountants what they needed, but at the same time it reduced the programming effort required by eight weeks. Just knowing the accounting concepts helped a great deal in this case.

As for the reader's comment that his peers are "pecking away" at getting their master's degrees, Confucius said it best, "Even a journey of 1,000 miles starts with the first step." Get going, friend. I speak from experience, having received both my bachelor's and master's degree at night.

**A** Thank you for this opportunity to set the record straight. The M.B.S. was a typographical error and should have been the master's of business administration (M.B.A.). I am a strong advocate of DPers understanding not only the basics, but the intricacies of the functional areas in which they work.

Whether a programmer seeks an advanced degree in computer science, information systems or business is dependent on his background.

Programmers should strive to obtain knowledge (or a degree) that provides the mix necessary to enable them to effectively communicate with users and to accomplish their job function.

## Turnaround Time

By Larry E. Long

Have a question? Send it to Larry Long, Editorial Department, Computerworld 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701. Long is a professor at Lehigh University, a DP consultant and author.

## DEC's Communicating Word Processors from

# HAMILTON

## The Digital WD80 Series Word Processor



**Immediate Delivery!**

Reliable and proven DEC hardware with sophisticated yet easy-to-use software. Great flexibility enables stand-alone use or communication to other word or data processing systems. Advanced text editing capabilities complemented by powerful list processing package.

DEC's PDP-based 80 series provides the ideal solution for any small work group with either word processing or word and data processing needs. Includes single-user or two-user systems and offers unparalleled flexibility in work load distribution.

### FEATURES:

- VT100 word processing video terminal(s)
- Diablo letter quality printer mounted in attractive media-storage cabinet. Output 540 words per minute
- RX02 diskettes. Provides 200-425 pages of storage

### OPTIONS:

- Communications packages provide network facility to DEC word processors: PDP8, PDP11 based minis; and Time-sharing bureaux etc.
- COS310 Dibal operating system
- Single sheet feeder attachment
- DEC draft printer. Output 2160 words per minute
- Sound enclosure for printer

HAMILTON, as established leaders in sales and rentals of computer and word processing systems, offer rentals of 3, 6 and 12 months, which include complete installation and ongoing service. Additionally, we include well-documented, intensive and thorough training for your personnel, and full, continuing support.

Call or write for pricing, literature and further information.

ALL RENTALS INCLUDE MAINTENANCE.  
PURCHASE OPTION LEASE PLAN:  
40% rebate of rentals applies against purchase price

**HAMILTON 212-695-1936**  
TOLL FREE 800-223-2430

HAMILTON Rentals

One Penn Plaza, New York 10119

LONDON

PARIS

DUSSELDORF

TORONTO



## EDITORIAL

### High Expectations

According to users who responded to a survey by Datapro Research Corp., Amdahl Corp. mainframe users like their systems better than users of any other equipment. Likewise, more Amdahl users than any other would recommend their systems to other users [CW, May 19].

Another source — this time researchers on IBM's payroll — hold Amdahl systems superior to IBM systems on a price/performance basis, according to internal IBM documents introduced this spring in the U.S. vs. IBM antitrust trial [CW, July 14].

Gene M. Amdahl, founder of Amdahl Corp., who retired from the post of chairman and chief executive officer last September, is the man behind those systems. Amdahl came from IBM, where he is credited with developing the architecture for the IBM 360 series of systems. He's no upstart in the business.

Thus it is with unbridled enthusiasm that *Computerworld* greets the news that Gene Amdahl is forming a new company to develop a system to compete head-on with IBM's intended H series.

IBM plug-compatible mainframes have been a boon to users, helping them save money without sacrificing efficiency, service or their library of IBM programs.

Amdahl, whose new company has yet to be named, expects to have his product ready for the marketplace by 1984, three years after the H series is expected to debut.

Given his past record, it may be something worth waiting for.



'How did IBM take my switch to the other outfit? Well, no worse than expected...'

## LETTERS

### On Behalf of Contractors

The Independent Computer Consultants Association (ICCA) wishes to respond to "More Harm Than Help? Managers Warned of Contract Programmers" [CW, Aug. 18]. ICCA is a national, not-for-profit, professional organization dedicated to "increasing professionalism in the industry."

Many of our members are independent contract programmers. Their livelihood is based on successfully providing services to client companies. We recognize that not all consultants or contract service organizations provide professionally competent services. That is one reason ICCA was formed in 1976.

We have established a code of ethics, are working on a code of professional conduct and have established a "Better Business Bureau" approach to enforcement. Each member agrees to abide by our codes. Complaints by clients are investigated and membership may be revoked for noncompliance. (Because of legal problems, ICCA cannot intervene when nonmembers are involved.) By policing ourselves, we can offer the business community the greatest potential for successful consulting engagements.

ICCA agrees that management information services (MIS) managers should exercise caution in contracting with any outside service. Always check references. It is easier than checking past employment history and probably more accurate.

Independent consulting is not a safe place for the incompetent. They are better off with full-time jobs. To be successful in this business, one must be a self-starter, technically competent, able to get along with people and, most importantly, must be able to deliver results.

Some of the poorest results come from dealing with what are referred to as "body shops." These organizations hire part- and full-time programmers off the street to fulfill time and material contracts. They take little or no responsibility for the work being done.

A contract programmer or small consulting firm is different. They take project responsibility. The principals of the organization must deliver to

contract specifications to be paid. Employees in this kind of firm often earn bonuses for jobs well done. There is a real sense of loyalty and responsibility.

Steven A. Epner  
President

ICCA  
St. Louis, Mo.

### Effects of Structure

Under most circumstances, I would have dismissed Philip Kraft's article "Programmers Seen Needing Fewer Skills" [CW, July 28] and the follow-up editorial "Software Workers of the '80s" [CW, Aug. 4] as two more entries in a rather boring lineage of articles predicting the demise of the programmer. What struck me was Kraft's bold assertion that structured programming and related techniques are the vehicle by which this change will come about.

Although I personally endorse structured methodologies, I am not aware of one controlled experiment showing that such methodologies affect programmer productivity, the quality of software or the evolvability of systems. A controlled experiment would have the following characteristics:

- It would involve the implementation of a real system.
- There would be two development teams, with members chosen on a matched-pair basis.
- All controllable factors would be identical (e.g., budget, schedule, management).
- It would be a double-blind experiment, with one team using the proposed technique and the other using a competitive technique.
- The experiment would preferably be run multiple times.

It's not surprising that people aren't running out to try these experiments. Who is willing to pay n times as much developing a system to test a technique they're convinced is worthwhile?

I don't believe that any methodology can ever replace a software engineer. However, if we are going to promulgate techniques that inject some science into the art of computer programming, we had better do it scientifically.

Paul C. Anagnostopoulos  
Maynard, Mass.

## DATA PAST

### Eight Years Ago Sept. 13, 1972

HARRISBURG, Pa. — In the wake of tremendous flood damage caused by tropical storm Agnes, the State of Pennsylvania considered issuing regulations requiring state DP centers to be located in flood-safe locations.

A task force was gathering data from flood-damaged centers.

### Five Years Ago Sept. 10, 1975

SPRINGFIELD, Va. — The Honeywell, Inc. 6180 CPU was better able to provide a secure operating system than the Digital Equipment Corp. KI-10, IBM 370, Xerox Corp. Sigma 9 or Burroughs Corp. B6700, according to a report prepared for the U.S. Air Force by Mitre Corp.

The DEC KI-10 rated close to the Honeywell machine in being amenable to the user implementing a secure system, the report said.

The 370 and Sigma 9, however, were both found to be "very difficult to use as bases for a secure system," and the B6700 would be an "extremely difficult" CPU around which to build a secure computing system, the report said.

KENSINGTON, Md. — Position titles in the computer field were in a "state of chaos," according to a report submitted to the Association of Computer Programmers and Analysts (Acpa). This was why programmers and analysts were being denied professional status, the report said.

READER COMMENTARY/James A. Eastman

# Some Project Leaders Suffer 'Fear of Flying'

When a system is about to be implemented, but things are not going smoothly, sometimes the project leader is the person causing the problems.

The reasons for this phenomenon are many and will be examined in some detail. However, they all relate to the fact that the project leader is afraid to implement his project — or, to use the catch phrase, he has a fear of flying.

This fear of flying may be obvious. The project leader may plead with his supervisor to be assigned to another project or tell the users that he wants to get off this project.

The project leader might even know the cause of his fear of having the project fly. For instance, he might feel that the proposed system will never satisfy the user or that the user still doesn't know what he wants.

One the other hand, this fear of flying might be well concealed, even to the point that the project leader with the fear will not admit it to himself.

There are a number of reasons a project leader might want to kill his project. Among them are:

- Fear of the user. In this case, the project leader feels the completed system will not meet the user's needs, either because the user wants the system to have a greater capability or because the user knows only what he doesn't want. In either case, the problem has been allowed to grow because the project leader and the user failed to communicate effectively. In many cases, the project leader probably found it easier to promise the world than to help the user develop realistic objectives.

- Fear that the project development steps to date were done in a sloppy manner. Every DP organization has procedures that supposedly ensure a good system, or at least that is what management wants everyone to believe. The development steps usually involve a sign-off after such stages as

the conceptual design. The project leader might feel as the project is about to be implemented that certain things should have been considered at a certain point, and since they weren't, that the project is doomed.

- Fear of having his work carefully examined. It might be that there is a formal review process of a completed project that can be embarrassing for a project leader. Even when there is no formal review process, it is obvious when there is a serious system failure.

- Fear of success. This is not the usual fear, but it is very real. If the project is a success, there can be a real fear that the project leader will be tied to it for a long time, while others get to work on more exciting projects.

Although a project leader might not know or be willing to admit that he is afraid of having his project implemented, the techniques he uses to kill his project are usually very deliberate and easy to identify and can be quite

ingenious in the process. Among the methods to kill a project are:

- Try to get the user to back down. This can be done by putting increased demands on him. For instance, the project manager will consult the user on every detail, often many times. Also, the project leader can make the proposed project appear to be impossible to maintain.

- Try to find another project that desperately needs the project leader.

- Look for changes in the user side. In this situation, the project leader looks for personnel changes and then quickly exploits the change, saying either that there is no longer user support or that the new user must be "educated" and that this will take time. Either way, the implementation date has been delayed.

- Decide that the system should be more "advanced." An example of this would be to suddenly insist that the system have on-line updating, when it had originally been decided that batch updating was sufficient.

- Find another job, or at least drop hints that the market looks good. This one is obvious and in DP shops, only too familiar!

Clearly, many of the reasons a project leader might want to kill his project can be traced back to the project leader himself. Often he has difficulty communicating or is really in over his head. (Continued on Page 44)

READER COMMENTARY/Peter Bodman

# Making Contract Programmers 'Fit'

I read with great interest the recent article concerning contract programmers, "More Harm Than Help?" [CW, Aug. 18]. While the piece was generally informative (though it may not have deserved such banner headlines), I believe there should have been a far greater degree of depth and counterpoint provided to readers.

By and large, "contracting" falls into four general categories:

- The first is "free-lance," whereby the contract programmer works in a totally independent manner, having no association with any type of programming service company, directly charging his clients for services.

- The next category is the "subcontractor," who is affiliated with a contract programming (or similar) company; although this relationship doesn't include the actual employment of the subcontractor, there is usually a legal agreement, or contract, in effect between the two entities for the duration of assignments.

This agreement, besides defining amounts to be paid for services and specifying work to be done, includes provisions for professional and ethical expectations by all parties concerned. Depending on circumstances, subcontractors are paid on an hourly T&M and/or fixed-price basis by the contract service company.

- The third category is what I call the "quasi" contractor, who is actually a captive employee of a programming/software service firm. As such, this individual, being a true employee, often receives benefits generally parallel with staff personnel of other companies.

- The last general category of contractor is the "consultant," whose overall knowledge, technical ability and analytical experience allow him to problem-define and/or solve dilemmas of DP installations. Typically, the consultant is a free-lancer, often because of the high rates for his services, though he can have a relationship with

any of the above categories.

Readers of the article may have assumed, erroneously, that all contractors are of the first type and, from the flavor of your article, each is out to rip off users and is an "occupational misfit."

## Not All Misfits

While I think that some programmers who have difficulty in maintaining positions of captive employment turn to the contract industry, not all of these people are, stereotypically, misfits. Let's face it: There are occupational misfits in any industry. Yet, through a comprehensive preassignment evaluation by the user (keeping in mind the technical requirements of the work to be done and the personality profile required to do it), DP management can often weed out potential misfits or incompetents before any damage is done.

Jumping around from job to job is really the name of the game for contract programmers, just as it is for mercenaries who are hired to fight wars for countries or ideologies other than their own; and, because the contract programming industry is so highly based on reputation, contractors seldomly remain active in it (for long) unless they're really good at what they do. Whether one talks about "loyalty" in a captive employee or the "pride" of a contractor, both nebulous terms at best, it is all who benefit if the assigned work is done correctly and on schedule.

In short, contractors go where the work is, where it's the best obtainable and where the pay is greatest — as most of us usually do anyway.

## Avoiding Resentment

The statement that "contractors stir up staff resentments and even contribute to personnel turnover by bragging about their salaries" is, I feel, a generalized potshot. While there are those "uneducated" contract program-

mers who do make such errors, captive employees have made the same errors with the same results. However, with careful instruction to the contractor, (Continued on Page 46)

THE TAYLOR REPORT/Alan Taylor

# DPMA Practices Show Lack of Sophistication

The Data Processing Management Association (DPMA) recently put on a recruiting campaign and, in doing so, committed a mixture of errors that seem to be endemic to that organization.

One of the recipients of a recruiting letter was R. Peter Ericson, director of data processing at the Institute of Living in Hartford, Conn. He replied to DPMA Executive Director Edward Palmer, pointing out the following:

(a) He had quit DPMA because he felt that "a professional data processing organization ought to set a positive example in its use of computers," and that, at the time, DPMA had not been setting such an example.

(b) The salutation in the recruiting letter, "Dear Peter D," did not demonstrate the sophistication that would be expected from a leading DP professional group.

He was right, of course. Where "Peter D" came from I don't know. There is no "d" in Ericson's name, so that is out. However, there are two "d's" in his title — "director" and "data." I suspect that one of these words was abbreviated, truncated and then used in a name field instead of a title or name-and-title field.

But regardless of the cause, one-letter last names just are not correct here, and a sophisticated user would have noticed this and stopped sending out the standard mailing until the real name was found.

Ericson did not let matters lie there. He wrote to Palmer, giving his reasons for having dropped out (the association's lack of leadership) and for believing that the flaw was still present (Peter D). Shortly thereafter, he got another form letter from Palmer, apologizing for duplicate mailing and mailing to members. But the letter did not respond to Ericson's comments at all!

At this point, Ericson must have felt justified in his criticism of the DPMA for lack of sophistication. But the crowning glory was still to come. Along came a follow-up, with a handwritten note from Palmer: "If your reply isn't already in the mail ..."

Then Ericson, with clear proof that replies sent to Palmer were not even read before replies were sent, blew up and sent the stack of letters to me.

The computer handling of DPMA has always looked somewhat below standard. And doubtless this lack of leadership is a major flaw to (Continued on Page 34)



# We Want You

TO REPRESENT DTC



Data Terminals & Communications is an international computer industry manufacturer looking for new dealers and distributors to represent their exciting line of computers and terminals.

We have been producing computers and related products since 1968 and have sold thousands of units world wide.

That's us briefly and if we interest you, tell us about yourself.

Write:

**DTC**

Data Terminals & Communications  
590 Division Street  
Campbell, CA 95008

## READER COMMENTARY/Peter Lacey

# Structured Coding's Twin Myths

It would seem to be about time that someone commented on the twin myths of structured programming: (1) that it is successful because it avoids GOTOs, and (2) GOTOs make a program less easy to understand. In actual fact, GOTOs have little, if anything, to do with it.

Let us consider the second myth. It is claimed that GOTOs obscure the logical flow of the program by jumping in or out of sequence. While this is certainly true of poorly planned programs, in which a programmer had to incorporate oversights or corrections as he went along, it does not apply in general. Every program consists of three phases: initialization, processing and termination. The processing phase always involves at least one loop and usually can be broken down into several sub- "programs" which involve the same three phases. This loop is represented by a starting point, an ending point and a transfer of control back to the starting point.

The clearest way of indicating this is with a GOTO: it can be done with a PERFORM, of course, but since this uses two implicit rather than one explicit GOTO and places the details of the processing (which usually would involve further PERFORMs) at a different level in the program, it cannot be stated that it is easier to understand.

Examples on these pages in the past have demonstrated what laborious circumlocutions are necessary to avoid a simple GOTO: nested IFs (which

should be avoided like the plague in any programming method), numerous artificial switches and nested PERFORMs ad infinitum. This sort of coding can become routine and natural, as can nearly anything, but in no cases but the very simplest will it produce a control structure as simple, direct and obviously mirroring the program flow as does a properly planned program using GOTOs.

Therein lies the rub, of course: proper planning. No programming method will produce quality programs if proper planning is ignored: any method will do so if it is, including structured programming. Elimination of GOTOs is not a program planning device, but it is an unavoidable method of forcing the programmer to do some planning before he sets pencil to paper.

Structured programming is a subset of structured design, which consists of carefully worked-out methods of designing systems and their component programs as thoroughly and methodically as reasonably possible, with as much emphasis given to review as to design. Such an approach will, in ev-

ery case that it is properly used, result in better programs (better by whatever criterion one wishes to apply).

Any complete and consistent planning method will produce similar results (I remember reading in *Datamation*, many years ago, about a 10,000-line Fortran program, planned with decision tables, which ran correctly on its first test) regardless of coding rules or language.

This brings us to myth No. 1. The successes of structured methods have come about precisely because of the emphasis on planning and review, not because of coding rules such as "no GOTOs." Let those who would dispute this give it an honest try: subject some system to a full-blown structured design and then program it using GOTOs. The results will be as good as before.

That there should be such a debate over inoffensive GOTOs indicates rather alarmingly how little understood or practiced is the planning function in this industry.

Lacey is an MIS manager with Co-Op Implements Ltd. in Winnipeg, Manitoba.

## DPMA Methods Old-Fashioned

(Continued from Page 33)

many. Sometimes it seems DPMA goes out of its way to demonstrate that it is old-fashioned.

Two examples spring immediately to mind — one very recent and one now some years old. In preparing for an Aug. 27 hearing on sales taxes, DPMA quoted a 1977 situation in which New York ended up exempting data processing and "decided not to apply old regulatory concepts to a whole new state of art, a new business." The association then urged Massachusetts to do the opposite by using a precedent set in 1936!

Similarly, in the long, drawn-out controversy over the DPMA "Man" of the Year award, one cannot help thinking that even when it was first set up — and presented that first time to Grace Hopper! — there was almost a death wish in labeling the award with a question-begging title. A different name, a different first recipient or a swift change of name would have made the association appear better prepared for the future.

But as it is, the public appreciation is of an association that reads neither the handwriting on the wall nor the letters that people like Ericson write. And that shortcoming, rather than minor incompetence, is why many don't join.

© Copyright 1980 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for noncommercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.



## When was the last time you heard a peripheral salesperson talk about service?

Sometimes the service is more important than the sale. Maybe you're computerizing a small business. Or want to add on just the right peripheral.

Our local salespeople can help. They'll introduce you to our applications engineers and interface experts. They'll get your equipment up and running. Even train your people on-site.

We're PSI, New England's leading independent peripherals company. With our peripherals you get this double guarantee: First, we final test all equipment again just to make sure. And second, if anything ever goes wrong we'll be there within 24 hours to solve the problem.

So check out our products and prices and give us a call. For a change, you'll talk with some salespeople who really know their service.

**PSI**

PERIPHERAL SYSTEMS INC.

Free Demonstration Room; 8:30 a.m. - 5:00 p.m., Monday-Friday.  
225 East Street, Winchester, MA 01890 Call (617) 729-7715 for an appointment.

New England's  
Leading Independent  
Peripherals Company.

P Printronix and Thilog printer/  
plotter systems as low as \$7000.

P Printerm printers as low as \$995.

K Kennedy disk and tape systems  
as low as \$8500.

I IBM and DDI CRT terminals as  
low as \$995.

I ISC Intecolor computers and  
terminals as low as \$1895.

I IDS communications equip-  
ment, short-haul modems and  
breakout boxes as low as \$250.



# "NCR's VRX is more transparent than any operating system I have ever seen."

Peter P. Blozis, H.J. Wilson Co., Inc.

## PETE BLOZIS:

"I've been in EDP for 19 years and have gone through many conversions. So I anticipated problems in installing our new NCR V-8585M. It turned out to be the smoothest conversion I ever experienced."

## LEA EDMUNDS:

"We had good reason to be apprehensive. We were putting in the first V-8585M to be installed anywhere. And, at the same time, we were switching to new operating software, NCR's VRX. We ran parallel for three weeks and never developed a conflict. As it turned out, we could have switched over in a single day."

## PETE BLOZIS:

"We resisted conversion as long as we could, and then discovered it was completely painless. The V-8585M hardware ran just as NCR predicted. VRX is more



Peter P. Blozis (right) is Wilson's Vice President, Information Services Division. Lea Edmunds is Technical Services Manager.

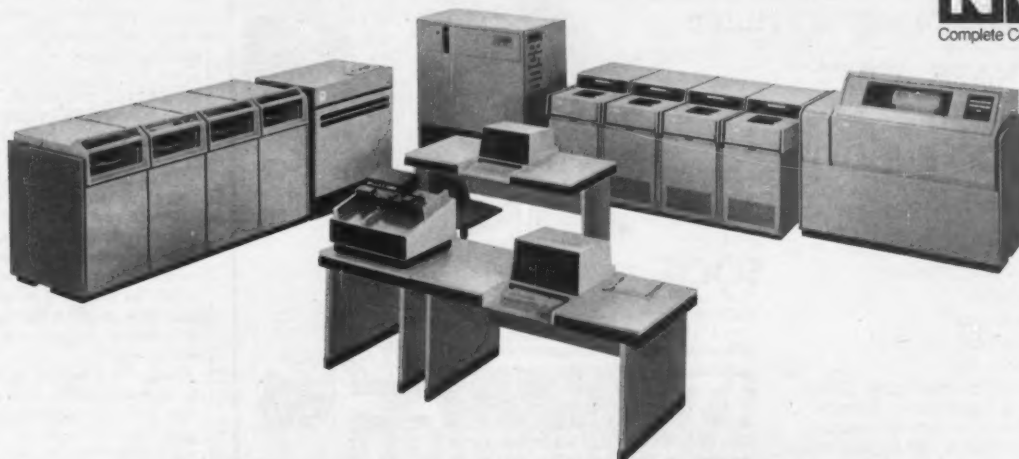
transparent than any operating software I have ever seen."

\* \* \*

WILSON'S is a chain of jewelry/ catalog showrooms that is spreading across the Sunbelt. And growing at the impressive rate of 37 percent per year. This growth has caused Wilson's to step through five NCR Century systems up to the V-8585M. Supporting an NCR system is easy. As Pete Blozis says "We can support our NCR V-8585M with fewer systems programmers than we'd need for other systems of comparable size."

Find out what NCR VRX can do for you. Phone your representative at your local NCR office. Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401. Learn how NCR brings a new level of convenience to data processing operations.

**NCR**  
Complete Computer Systems



**An NCR computer can make it happen for you, too.**

## READER COMMENTARY/Girish Parikh

# Software Maintenance Methods Need Refining

The In Depth article "Maintenance Programming" [CW, July 28], by David M. Clark, is one of the gems in the rare but urgently needed literature on how to do maintenance. I offer the following thoughts based on my study and experience.

While other aspects of software maintenance, such as documentation, software tools in maintenance, maintenance management techniques, maintenance reviews, structured retrofit and structured maintenance aid in the maintenance process, the actual maintenance work (also known as direct maintenance, or solving the immediate problems) is the heart of software maintenance.

Techniques of direct maintenance include the technical as well as the managerial areas. Direct maintenance programming addresses the technical problems and includes techniques to

solve them.

Other techniques of software maintenance that are implemented and the nature of software to be maintained (that is, structured, semistructured or unstructured; if structured, the methodologies used to develop it) affect the techniques of maintenance programming. To an extent, some of the maintenance programming techniques can be generalized and from this generalized store of knowledge, techniques can be adapted or specific techniques developed for a particular problem.

The generalization of the techniques may begin from the study of the specific maintenance problems and techniques and may transpire over a period of time.

A changed program may or may not work or may even be worse than the original program, depending on the quality of the original software, the

magnitude of changes and problems and the competence of maintenance programming.

## 'Black Box'

What goes on in the black box of maintenance programming? Well, that is the mystery to be unraveled. The techniques of maintenance programming, collected from the often-guarded secrets of a few, can be refined or developed further and made public. Thus, maintenance programming methodologies can be developed.

Maintenance programming, practiced widely, but not yet a formal discipline, is a wide subject like development programming. Some techniques may overlap, however. Maintenance programming should have its own body of knowledge — a collection of tips, techniques, guidelines, standards and sources. I emphasized this point in "Maintenance!" [In Depth, CW, Dec. 10, 1979]: "The need for collecting and developing techniques to handle such unstructured software is even greater than that of structured software."

Clark referred to "a formal methodology in how to make changes to an existing program." The methodology, in my opinion, is concerned with much more than merely changing a program. Preserving the integrity of a program is equally important, so that the maintainability remains at the prior level or is even improved upon. The dual-purpose, direct maintenance programming of unstructured programs should primarily aim at successfully changing the program and secondarily improving the maintainability, whenever possible.

The major structured methodologies should incorporate maintenance techniques appropriate for each method, for providing guidelines in making changes, as well as for preserving the structural integrity during that pro-

cess. Jean-Dominique Warnier of CII Honeywell-Bull, France, has done notable work by providing guidelines in his book, *Program Modification*, for modifying programs developed according to the Logical Construction of Programs (LCP) method. I believe Jackson methodology also provides some guidelines for changing programs developed using that method. To my knowledge, such work has not yet been done for other methodologies.

## How Much Help?

The next point I would like to address is how much help should be provided in determining how a programmer should go about making a change.

Some programmers are good in investigative (like investigative reporting?) aspects of maintenance programming. They incessantly dig into the listings and other sources and point out where changes should be made. Then they lose interest or are not good in further work. A lot of work still remains: making the changes, compiling, creating proper data if not available, testing, verifying the results, updating documentation, saving the old program and installing the changed program. In the future, specializations in maintenance programming may emerge. Such routine tasks can be described in a maintenance programming standards and guidelines manual.

After an expert determines where to make changes, the rest of the tasks can be done by a junior programmer or a maintenance programmer technician under the direction of a responsible senior programmer. The expert may, meanwhile, divide his time to solve other problems. This method should prove to be more cost effective.

The systems analyst should generally be able to define the system problem, or otherwise he would not be able to help the programmer. For instance, in a major Midwest company for which I worked, an analyst gave me an assignment which said, in essence, "Find the problem and solve it!"

Finally, the maintenance programmer, while attacking the direct maintenance problems should also look forward, keep notes and develop maintenance strategies to enhance and improve the life cycle of the system. He should take time to plan ahead (management should encourage this).

Having insights into the program, he is in a unique position to outline the strategies. Also, after looking at what has been done, he can usually establish a pattern and draw inferences. Management should provide training in these areas and reward the efforts of a maintenance programmer.

With the advent of maintenance programming methodologies, a discipline of software maintenance engineering will emerge.

Readers are invited to comment on the techniques they have developed to cope with the maintenance problem, by writing to Parikh at Shetal Enterprises, 1787B W. Touhy, Chicago, Ill. 60626.

Parikh is a consultant specializing in software maintenance and structured methodologies.

Copyright © 1980 by Girish Parikh. All rights reserved.

## VAX® & PACS™

... team up to solve your problem of Resource Management and Chargeback.

Signal Technology's Process Accounting and Chargeback System (PACS):

- Satisfies in-house, commercial and government contract audit requirements.
- Reports use of all system resources to help optimize configuration and chargeback rates.
- Reports current charges to users on-line.
- NEW! Software packages and non-standard devices can now be accounted ... plus many other features...

\*VAX is a registered trademark of Digital Equipment Corporation



For further information, contact

**SIGNAL TECHNOLOGY, INC.**

15 WEST DE LA GUERRA • SANTA BARBARA, CA 93101 • (805) 963-1552

## ITI'S CDI MODEL 1030

Portable Teleterm Printer...

"THAT'S A BIG  
10-4  
GOOD BUDDY!"

- 96 upper and lower case character set
- Portable, 22lb. terminal
- Built-in acoustic coupler
- Thermal printer
- 10, 15, or 30 cps
- RS-232 interface
- 90 day warranty
- The CDI 1030 also includes: USASCII, Teletype-33 compatible keyboard with electronic character interlock, 80 characters/line, Half or full duplex, 110, 150, or 300 baud, and more...
- Maintenance contract available for \$312/year



ONLY

**\$995** (factory reconditioned—original price \$2350)

INEXPENSIVE,  
ONE-STOP COMPUTER HARDWARE,  
SOFTWARE AND MICROFILM SHOPPING!



Information Technology, Inc.

56 Kearney Road, Needham, MA 02194/(617) 444-5702/TWX 710-325-6838  
• New York (212) 938-0945 • Manchester, N.H. (603) 668-9777  
• Chicago, Ill. (312) 876-1573 • St. Louis, Mo. (314) 454-0412  
• Atlanta, Ga. (404) 588-1518 • Washington, D.C. (202) 342-0889  
• Minneapolis, Minn. (612) 370-1258 • Houston, Tex. (713) 799-0730  
• Seattle, Wash. (206) 523-1091 • Long Beach, Ca. (213) 995-1257  
• San Francisco, Ca. (415) 956-2901



OEM Inquiries Invited

# PREMIUM COMPUTER.

When Wisconsin Life added  
a Level 6 computer their customers  
were the real beneficiaries.

**N**ot all insurance companies are slow-moving behemoths. Wisconsin Life just installed one of our Level 6 computers and is now processing most claims within 72 hours. Response time has been cut by a full 80%.

## Businessware.

Wisconsin Life is benefitting from something we call Businessware. A well-balanced combination of the right hardware, the right software, and Honeywell's vast business experience.

Everything our salespeople have learned in 25 years of working with businesses has been put into Businessware.

TPS-6 is part of Businessware. Thanks to this built-in transaction processing system, Wisconsin Life's new computer is helping in three key areas. First, linked to a network of 60 terminals, it's making clerical functions easier to perform.



Clerks now use terminals to check the nuts and bolts of individual claims: Is this policy valid? Has this claim been paid before?

In all, there are more than 30 screen formats.

Once a claim has been approved, a check is written that night. Since the Level 6 arrived, many claims have been paid in a single day.

The Level 6 has also been helping Wisconsin Life develop new applications for their transaction processing capability. For instance, there's a program in the works now that will enable them to process all new business on-line.

One advantage is that the computer can be used to calculate premiums, thus eliminating a great deal of work currently done by hand.

Finally, the Level 6 runs a very efficient data entry facility. Once CRTs are installed, clerks will be able to correct errors immediately, substantially reducing overall system maintenance costs.

## Services Improved.

Wisconsin Life's new Honeywell is doing precisely what we knew it would. It's giving them greater control of their operations. And in so doing, it's increasing the quality of service Wisconsin Life offers their customers.

On Wisconsin!

For a more detailed look at the Level 6, write Honeywell, 200 Smith Street (MS 487), Waltham, MA 02154.

# Honeywell



## READER COMMENTARY/ Paula Bell

# Technical Writers Must Aim for Clarity

I have been a technical writer for two years, long enough for me to wince at less-than-complimentary remarks concerning user documentation.

Critics are not limited by specialty or by level of experience. The user may be an experienced systems analyst or design engineer, a field engineer who has been cross-trained and is not practicing his initial specialty or a novice computer operator who is filling in for the regular operator who is recovering from a skiing accident, for example.

I must risk agreeing with the critics or sounding like the ex-English instructor that I am. My point is that writers in the DP fields must take the responsibility for improving technical documentation.

I mean both hardware and software writers, writers with technical knowledge who may not remember much of what was presented in their last English class — or in what year — and writers with composition skills who are still memorizing acronyms and trying to believe that you really can multiply in binary.

## Two Advantages

Technical writing offers two exciting advantages: Valuable access to information, enough to keep up with technological advances in the most advanced of all technologies and invaluable opportunity to practice discipline in the craft of writing.

Communication media and their support industries are proliferating. We are all bombarded with anomalous, useless, and ambiguous data passing as information. An example of each follows and may produce a wry grin in addition to the frustration.

A newsreader, reporting an accident, informed his audience that four of seven people involved were "ambulatory." The other three were able to walk away from the accident.

Or maybe you read about the consensus of the vulcanologists in authority after Mount St. Helens' first spectacular newsworthiness: "We don't know what will happen, but whatever it is, we expect it."

Everyone has come across

governmentese like, "No child shall be employed on any weekday when the school is not open for a longer period than four hours."

I have the dread feeling that somewhere among my own published paragraphs I may have committed an equal folly; I only hope my readers enjoy it as much.

We can lessen the amount of worthless information (if such a paradox can exist) and refine the medium by which the message will be carried by writing with precision.

The technical experts — programmers, engineers and designers — are responsible for reading a proposed manual in order to correct technical er-

rors involving contradiction or inadequate information.

Technical experts should not be required, or encouraged, to do a rhetorical edit. Experts are busy too, as they may state, and many do not consider documentation review an essential objective in their pursuit of the leading edge of the state of the art.

If an explanation or a procedure is unclear or incomplete, the expert, already understanding the material and not having to read for information, may not notice the confusion. The writer cannot compensate for these omissions. However, the writer must be the expert in all other

(Continued on Page 42)



## REQUEST FOR PROPOSALS

Proposals are requested from firms qualified in the MIS field to conduct a Systems Study of the Rental Assistance Program of the Housing Authority-Milwaukee.

For an RFP package, contact:

Housing Authority-Milwaukee

P.O. Box 324

Milwaukee, WI 53201

Attn: Jon Granger,

414/278-2171

## On Management

I read with pleasure Howard A. Karten's response to my commentary [CW, July 14]. He wrote well and addressed himself to the issues. As with any important aspect of management and technology, there are legitimate areas of disagreement. However, there are some points I wish to clarify.

Karten made reference to the "... job knowledge required by users." I was writing strictly about job knowledge required by programmers. I agree wholeheartedly with

him that users should be buffered from changes in technology.

Also, the example he presented of the futility of "trying to achieve a fancy overlay structure that uses 10K fewer bytes when the cost of the programmer's time is greater than the gain in efficiency" actually proves my point.

It is technical management which must maintain an envi-

## LETTERS

ronment of awareness and pride in keeping up with changes in technology — and cost is a factor of technology — which would discourage the technical staff from such anachronisms. As recently as 1979, I heard about a manager who advocated two letter variable names because "the resultant programs take less time to compile!"

I also agree with Karten that

"a manager is supposed to manage work, not do it himself." But part of managing is understanding. The General Electric Co., one of the major proponents of generalized management, still has engineers managing its engineering sections for that very reason.

I want it clearly understood that I am only addressing technologically intensive ac-

tivities, such as program development and engineering.

I also agree with Karten that selecting, training, motivating and retaining people has become tougher in the past decade. That, in fact, is the central point to my commentary.

How do you select one programmer over another if you don't appreciate the importance of structured walk-throughs?

How do you train employees if you don't know what training they need?

How do you motivate a programmer to take pride in his work if you tell him to save 10K bytes with a fancy overlay structure?

Finally, how do you retain employees when they don't respect your understanding of the technology they must employ?

Floyd McWilliams  
Stanley, N.Y.

## Everyone's Paying

How often do we read or hear something and not see or listen to the intended message?

John Stewart's statement in his letter [CW, July 14] that there was "no loss of relevant material" in my data theft case was unwarranted.

Regarding the \$2,000 in charges made on four different account numbers within one week, the thief did get a TV valued at \$633. We are all paying for this, along with all other thefts of merchandise.

If you do not believe this, ask any police fraud squad and/or your casualty underwriter.

The message is, tighten up credit practices to ensure privacy and accuracy.

Recent events since the publication of my story have pinpointed the access to our, and possibly other, TRW Credit Data profiles by another organization not previously mentioned.

Alan E. Kahn  
San Anselmo, Calif.

# A solution to a human problem in information management.

The Bell System knows that information management works best when it's people oriented. After all, that's been the basis of our business for years. So our Dataspeed® 4540 data communications terminal is human engineered.

It has a display unit with a tilting screen to eliminate glare and eye fatigue. Plus simplified controls on the console. And you get a choice of keyboards with numeric cluster arrangement.

Of course, the terminal is every inch an information management problem-solver. It transmits at speeds from 2400 to 9600 bps efficiently, has built-in diagnostics, greater hardware flexibility and 3270 compatibility.

Its microprocessor-based controller interconnects with up to 32 devices. Eight of them can be printers which can be located up to 2000 feet away from the controller. Keyboard displays can be up to a mile away.

The Dataspeed 4540 data communications terminal. You can expect it to add efficiency and economy to business applications involving inquiry response, data entry and retrieval.

With our knowledge, our advanced communications technology, our thousands of experienced information management specialists, we can help your business. A call to your Bell Account Executive will put our knowledge to work for you.

**The knowledge business**



## Wanted Software Products

IBM Systems OS or DOS  
for  
Marketing Organization  
Send specifications or call

Alanthus Data Products  
Corporation  
1750 Montgomery Street  
San Francisco, CA 94111  
(415) 392-7740

**Alanthus**

## HUMAN CONNECTION/Jack Stone

# Programs Help States Target Emergency Aid

What do state governors do in the event of sudden and large-scale riots in their cities? Or erupting volcanoes in their countrysides? Or sinking oil tankers near their shores?

Most citizens know that the governor responds with emergency assistance for casualties, acts to reduce the probability of secondary damage, provides special forces to maintain security and speeds recovery operations.

But during recent years, the number and diversity of man-made disasters have dramatically increased. Governors have found it difficult to handle them as effectively as necessary because of a limited supply of trained

personnel and special equipment.

Furthermore, although there are many federal government programs that provide emergency assistance, each has its own mandate and restrictions, which makes coordination difficult in times of crisis.

In 1977, the National Governor's Association (NGA) urged Congress to consider the consolidation of these efforts. The end result was the formation in 1979 of the Federal Emergency Management Agency (Fema), whose job is to set national policy and operate the major disaster assistance programs.

NGA also organized the Emergency Preparedness Project, under the direc-

tion of Hilary Whittaker, to examine the state's problems in managing all types of emergencies. Here is a summary of a recent interview I had with Hilary and her two associates, Vern Wingert and Jaynelle Ketchum.

*What were the findings of the project?*

**HW:** We identified several important areas of concern. First, working with Fema, each state has the capability to coordinate its responses to presidentially declared disasters, which number perhaps 40 to 50 per year across the entire nation. But very few states have the resources to handle their share of the 30,000 to 40,000 lesser disasters

that occur each year, such as those involved with technological hazards, energy and materials shortages, droughts or civil disturbances.

Second, emergency operations appear to be fragmented at both the federal and state levels, by emergency type, phases of management and organizational involvement.

*What do you mean by "phases of management"?*

**HW:** We describe emergency assistance in terms of Comprehensive Emergency Management (CEM), a four-phase management process. The first is mitigation, long-term actions intended to eliminate or reduce the possibility of a disaster, such as legislation to control the storage of nuclear waste.

Second is the preparedness phase in which plans are drawn up to save lives and minimize the effects of those disasters that cannot be avoided. Third is response, which is generally understood, and the fourth is recovery, during which short- and long-term projects are implemented to return life to normal conditions or, better yet, to a less disaster-prone level.

*What is happening with regard to improving CEM operations?*

**VW:** Fundamental to the proper management of emergency assistance, just as in any other government activity, is the acquisition of data that can quickly help identify program resources. We have recommended a long-term program of computerization to accomplish this goal. As a matter of fact, we have just recently implemented our first computer application and are delighted with the results so far.

*Could you describe it?*

**JK:** Surely. First, some background. By our count, there are currently 315 federal programs which provide 26 different types of emergency assistance to the states in 30 subject-matter categories. Each subject category is, in turn, organized into dozens of subcategories.

**VW:** And each of these programs has its own set of requirements by which a state government or other applicant may qualify for assistance. The governors complained that it was very difficult to determine, in time of emergency, just which federal programs could be utilized.

**HW:** First, we researched these federal programs and summarized their key provisions in an easy-to-read catalog. Then Jaynelle developed a keyword index to the federal assistance programs, and we arranged for software to be developed to convert the index into a computerized data base. We named the application National Emergency Assistance Programs (Neap).

We chose Neap as the first application because it served an immediate need. Also, it required relatively few resources to implement. Fema agreed and supplied the funding for the effort.

Its value has already been demonstrated: working with Neap, we were able to help governors quickly identify relevant federal assistance programs in the Mount St. Helens eruption, the Miami riots and other recent emergencies.

## To all large-scale IBM users. Congratulations, you now have another large-scale IBM.

It all happened because of the threat of disaster.

The Sungard Center. Established as a highly advanced disaster/recovery service. Utilizing IBM's largest computer.

We're glad to report that response to this service has been overwhelming. We're also glad to report that no one has yet had a disaster.

So now we find our 3033 has a lot of spare time on its hands. As will our shortly-to-be installed 3031.

As a result, you now have second center capability. For batch processing. Or systems development, without

interruption to existing programs. Or as an interim capability until IBM introduces its new package.

We offer this spare time at extremely attractive rates. Because it's pre-emptible. In case the center is ever needed for disaster recovery.

More information is just a coupon away.

Whatever the need, remember, you now have another computer to count on.

Sun Information Services Company  
Sungard Services  
656 E. Swedesford Road  
Wayne, PA 19087 (215) 972-4776.

CW 305

I want to know more about:

- ☐ Systems development and testing.  
☐ Software conversions. ☐ Remote batch processing.  
☐ Timesharing. ☐ Other \_\_\_\_\_  
☐ Please send me more information. ☐ Please call.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Phone \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

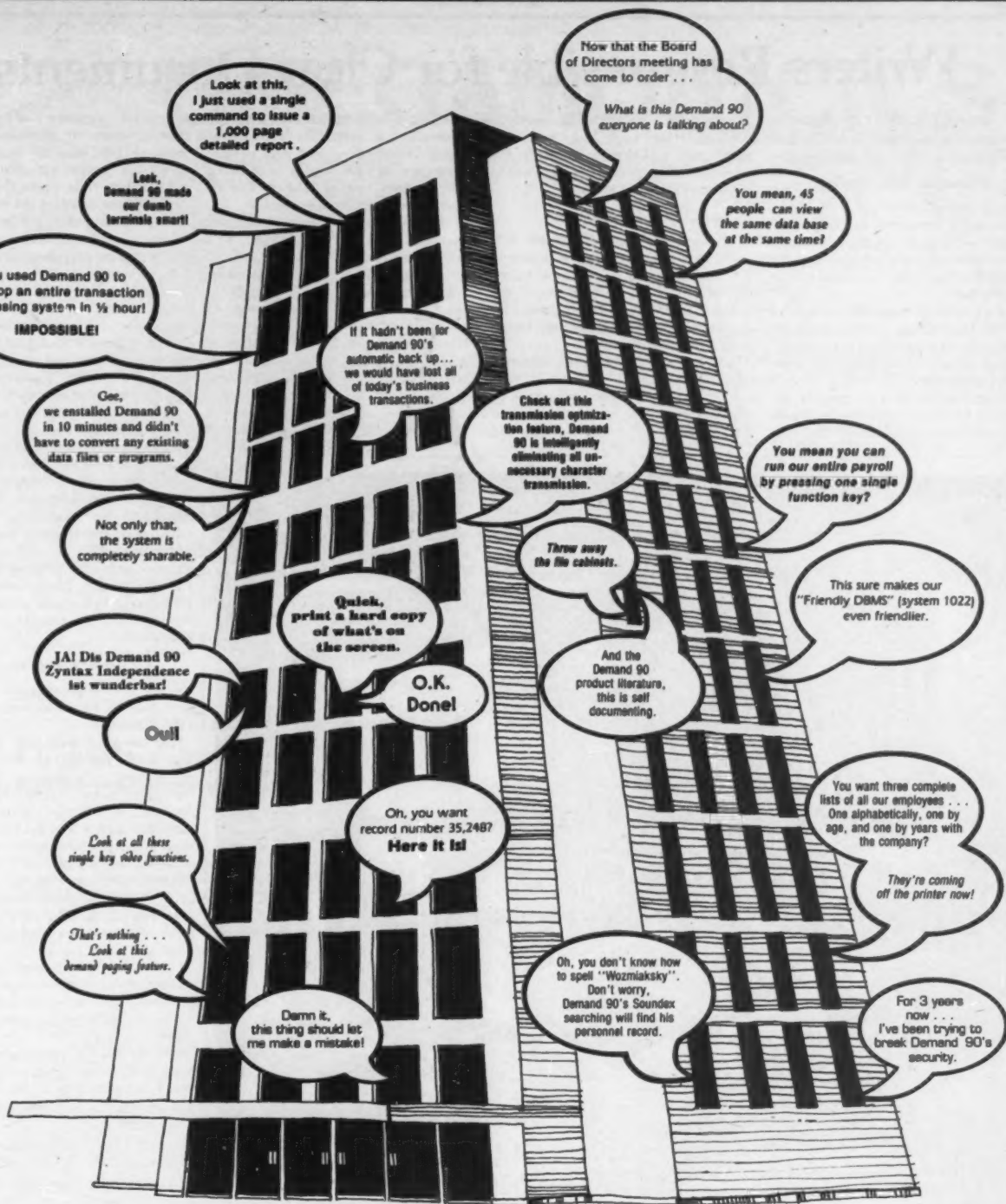
Zip \_\_\_\_\_

**Sun**

A Sun Company Subsidiary

**INFORMATION  
SERVICES  
COMPANY**





Look at this,  
I just used a single  
command to issue a  
1,000 page  
detailed report.

Look,  
Demand 90 made  
our dumb  
terminals smart!

You used Demand 90 to  
develop an entire transaction  
processing system in 1/2 hour!  
**IMPOSSIBLE!**

Gee,  
we installed Demand 90  
in 10 minutes and didn't  
have to convert any existing  
data files or programs.

Not only that,  
the system is  
completely sharable.

JAI Dis Demand 90  
Zyntax Independence  
is wunderbar!

Out!

Look at all these  
single key video functions.

That's nothing...  
Look at this  
demand paging feature.

Damn it,  
this thing should let  
me make a mistake!

Quick,  
print a hard copy  
of what's on  
the screen.

O.K.  
Done!

Oh, you want  
record number 35,248?  
**Here it is!**

Now that the Board  
of Directors meeting has  
come to order...

What is this Demand 90  
everyone is talking about?

You mean, 45  
people can view  
the same data base  
at the same time?

Check out this  
transmission optimiza-  
tion feature, Demand  
90 is intelligently  
eliminating all un-  
necessary character  
transmission.

Throw away  
the file cabinets.

And the  
Demand 90  
product literature,  
this is self  
documenting.

You mean you can  
run our entire payroll  
by pressing one single  
function key?

This sure makes our  
"Friendly DBMS" (system 1022)  
even friendlier.

You want three complete  
lists of all our employees...  
One alphabetically, one by  
age, and one by years with  
the company?

They're coming  
off the printer now!

Oh, you don't know how  
to spell "Wozniaksky".  
Don't worry,  
Demand 90's Soundex  
searching will find his  
personnel record.

For 3 years  
now...  
I've been trying to  
break Demand 90's  
security.

DEMAND 90  
available to DECsystem 10  
and DECsystem 20 communities.  
For information contact:  
the Olamic Systems  
Corporation, Software  
Publishing Division, 503 N.  
Euclid Avenue, Bay City, MI  
48706 (517) 686-7725

See Us  
At  
**SOFTWARE  
INFO**  
September 30-31, 1988  
Hyatt Regency Hotel, Chicago

# DEMAND 90

VIDEO TRANSACTION MANAGEMENT SYSTEM

BOSTON • CHICAGO • DETROIT • WASHINGTON D.C.

# Writers Responsible for Clear Documents

(Continued from Page 36)  
aspects of composition, including diction, grammar, structure and format.

## Rhetorical Skills Needed

The technical writer needs the rhetorical skills important to creation of all good writing, the organization skills particular to technical writing and the terminology peculiar to writing in a specific field.

The writer must have adequate technical understanding to write about diverse subjects concerning the assigned manual, its specific purpose and its intended audience.

The subject must be thoroughly researched by interviews with the developers and through document research.

The resulting information must be evaluated for exclusion, inclusion, elaboration and then arranged in the proper form for presentation. Now the writer can sit down to write.

## On-the-Job-Education

Continual technical education is a part of the job, as it is for everyone in DP. Writing skills are often acquired on the job during the writing of the manual (on the run) or independently (between assignment crunches). We all need to keep learning.

To writers who have come to technology from writing: what does 2\*\*31-1 really mean in the grand schematic of things? To writers who have come to writing from technology: There are

fewer rules for grammar than there are mnemonics in assembler language or logical alternatives in chip design. There are far fewer rules to learning how written English works than to learning how a computer works.

Following the basic prescriptions in one good grammar and rhetoric text can help any writer compose more useful manuals. Reviewing Strunk and White's *Elements of Style* once or twice a year is a great refresher and it's less than 100 pages in paperback. True, one must master some grammar jargon, but none more intimidating than technical jargon such as electromagnetic actuator or linear optimization.

Every writer knows how much easier

it is to edit someone else's work, how inconsistencies or anomalies in form, logic or reference are more quickly seen from another viewpoint. But it is not often possible, under the pressures of a deadline, to enjoy the benefits of a rhetorical edit before publication.

Some writers assume that readers will not recognize inappropriate rhetorical conventions — that users are unaware of haphazard punctuation or illogical connections.

However, many readers of technical publications are also avid readers in other fields and get annoyed at the drop of a comma. The reader is distracted from the information and the writer — maybe even the company — loses credibility.

Other readers will not recognize a grammatical slip, but also will not read prose that is more complicated than the computer operation being explained. The reader is confused, whether or not realizing that it is the writing at fault.

Good technical writing is like a friendly system. Implementations are transparent to the user and the writing does not further complicate complex subjects.

## Some Suggestions

In the interests of organization, clarification and simplification, I suggest the following:

- Know your audience. Though it may not be efficient to write expressly to the temporary operator waiting for the return of the experienced operator on crutches, writing only for the latter probably means that many who most need to use the information will find it frustratingly difficult.

- Maybe you can't please all of the people, but you can at least tell them who you think they are by job title, level of experience and prerequisite reading.

- Be consistent. Second person — subject understood or expressed — is generally the most concise; don't switch to third person without good cause.

- Never trust a technical term. Almost every sentence in a manual has one. The easiest way to check meaning is to ask another technical expert to define the word.

- Avoid passive voice. Its use is often an excuse for inadequate research.

- Make logical connections. "However," for example, is never synonymous with "consequently." Show cause and effect each time and only when it exists. Conjunctions are tricky and have the power to make or break a logical connection just as an OR gate will not work where the decision rests on an AND.

- Use a pronoun only when its referent is clear, especially "it." In the sentence immediately preceding, "its" is the pronoun; "pronoun" is its referent. A vague pronoun defaults to the last named noun; however, that is not always the intent.

I hope that it provides impetus for all of us who write to think about the ways in which we can make ourselves more skilled, our documentation more useful and our users more informed. Then we'll be better able to do our jobs — telling the technical experts how to keep those systems up and running.

Bell is a senior technical writer for Amdahl Corp. in Sunnyvale, Calif.



Move over,  
DEC VT-100...

## MIME-100 IS HERE!

Our new imitator, the MIME-100, will do everything the DEC VT-100 does, and for considerably less money. Even extra-cost options for the VT-100 are included as standard features on the MIME-100.

### For Details:

1314 HANLEY INDUSTRIAL COURT • ST. LOUIS, MISSOURI 63144 • (314) 968-8151 • TWX: 9107601662, MICRO-TERM, STL.

MICRO-TERM, INC.



Candle announces a new generation of software monitors

Announcing

# OMEGAMON/CICS



## OMEGAMON/CICS Features

- "Dedicated Mode" - high availability
- Dynamic Screen Formatting
- System Wide Exception Analysis
- Targeted Degradation Analysis
- Tutorials for Education

Candle Corporation also announces  
**RTA** - The CICS Response Time Analyzer  
**DEXAN** - The MVS Degradation Analyzer

The most advanced CICS  
 diagnostic facility  
 in the world!

Finally - the complexities of CICS  
 have been conquered!

OMEGAMON/CICS is a software  
 monitor with new insight into CICS  
 problems. This new technology will:

- Help you improve CICS Response Time
- Help you reduce CICS overhead
- Help you retune CICS after adding more terminals
- Help you retune CICS after adding new transactions
- Help you plan and justify extra hardware for CICS
- Help solve CICS manpower problems by making everyone a CICS expert - fast!

For more information on any of  
 these exciting products please note  
 the Free Product Seminars and  
 Product Information coupon below.

**! Candle Corporation 4676 Admiralty Way #624, Marina del Rey, CA 90291 (213) 821-2902**

## CICS and MVS Seminars!

In 1978 our popular seminars drew over 500 people. In 1979 - over 700! This year will be even more exciting with specialized topics in MVS (SRM) and CICS. Reserve now to ensure your space! Note - the afternoon seminars are free!

**MVS Seminar**  
 8:30 to 12 noon  
 I/O Analysis  
 SRM Tuning  
 MVS-SP

**CICS Seminar**  
 8:30 to 12 noon  
 "Crash Course in Analyzing  
 and Tuning CICS"

Cost (each course) \$75/person, 3 or more: \$65/person  
 Late registration at the door: \$95/person  
 Lunch: Included Afternoon Session: Free  
 Afternoon: New Techniques for Monitoring CICS and MVS.

| City             | Place               | Date        |
|------------------|---------------------|-------------|
| Detroit          | Detroit Plaza       | Sept. 22-23 |
| Chicago          | Ascot Hotel         | Sept. 25-26 |
| San Francisco    | Hyatt Regency       | Sept. 29-30 |
| Atlanta          | Hyatt Regency       | Sept. 29-30 |
| Washington, D.C. | Marriott Key Bridge | Oct. 1-2    |
| Los Angeles      | Marriott-LAX        | Oct. 2-3    |
| New York         | Barbizon Plaza      | Oct. 6-7    |
| Boston           | Parker House        | Oct. 8-9    |
| Dallas           | Dallas Hilton       | Oct. 13-14  |
| Houston          | Hyatt Regency       | Oct. 15-16  |

For more information call the seminar hotline at (213) 823-9224.

### Product Information

Please send information on:

- ☐ OMEGAMON (MVS Monitor)
- ☐ DEXAN (MVS Degradation Analyzer)
- ☐ OMEGAMON/CICS (CICS Monitor)
- ☐ Response Time Analyzer (for CICS)

Name \_\_\_\_\_  
 Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_  
 State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_

### Seminar Registration

- ☐ Enclosed please find \$\_\_\_\_\_ for \_\_\_\_\_ people for the CICS Seminar

Location \_\_\_\_\_ Date \_\_\_\_\_

Attendees \_\_\_\_\_

- ☐ Enclosed please find \$\_\_\_\_\_ for \_\_\_\_\_ people for the MVS Seminar

Location \_\_\_\_\_ Date \_\_\_\_\_

Attendees \_\_\_\_\_

- ☐ Please Register \_\_\_\_\_ people for your free product presentation.

Location \_\_\_\_\_ Date \_\_\_\_\_

Attendees \_\_\_\_\_

**! Candle Corporation**

Mail to: Dept. A-47, Candle Corporation, 4676 Admiralty Way Suite 624 Marina del Rey, California 90291



# Project Leaders Often Suffer 'Fear of Flying'

(Continued from Page 33)  
head.

However, there are a few things that the project leader can do to prevent the situation from happening in the first place.

The following are some of the things that he might consider doing:

- Be thorough during all phases of development. There is nothing worse than getting near the end and feeling that

an important form was not properly designed and reviewed or that the edit specifications for a program might be next to useless.

- Keep technically abreast of developments. This prevents others, including the user, from telling the project leader how to do his work.

- Get firm (documented) commitments from the user. This prevents the user from changing the specifications

without the change being documented. Also, these documented commitments prevent the project leader from having a fear of user rejection.

- Explain the proposed system to anybody and everybody. Then no one is surprised by the final product. The process of explaining will also help the project leader gain confidence.

- Remember that almost any product is better than no

product. This is true both for the project leader's in-house advancement and for his resume.

- Remember that most projects require risk.

- Remember that no system is perfect. Even the best systems require maintenance.

- Recall past successes. In doing this the project leader should analyze the successes and see how this project can be made to be just as successful.

ful.

- Don't play down the system. If he downplays the system, before he knows it, the project manager will be believing his own modesty.

One final note: Clearly the supervisor of a project leader or an "enlightened" user needs to give the project leader all of the support he needs. A successful project requires the enthusiasm and support of everyone concerned.

*Eastman is director of research and statistics for the Department of Social Services, State of Missouri.*

## Security Software? SAC The Proven Alternative for Data Security!

Information "leakage" doesn't just happen to the "other guy", it can happen to your company as well. That's why you need the proven protection of the Security Access Controller (SAC) from Electronic Data Systems (EDS), because physical security is not enough. SAC enables you to decide who may gain access to your confidential information, and to what extent. It's the most efficient security software available.

**SAC IS UNIQUE**... a fast, efficient and comprehensive system designed to solve the complete software security needs of a corporation.

**SAC IS PROVEN**... the result of over four years in meeting strict standards for security in a wide variety of business and technical environments. And now available to the data processing marketplace.

**SAC IS SUPPORTED** by Electronic Data Systems Corporation. One of the largest data processing service companies in the world. And EDS is committed to the continuing support and improvement of SAC.

**SAC IS AVAILABLE** for immediate use. It can be installed and running within hours. And, EDS is dedicated to maintaining compatibility with current and future releases of IBM's operating systems.

### SAC WILL:

- Provide System Entry Protection
- TSO Protection
- IMS-CICS Protection
- Dataset Protection
- Class & Priority Controls
- Adapt to your standards & naming conventions
- Support VS1, MVT, and MVS

### SAC WON'T:

- Use Excessive CPU Resources
- Require usage of a valuable technician full-time to maintain
- Require you to write reporting & user exits to meet your accountability requirements
- Require you to redo your security criteria each time your requirements change



# EDS

System Software  
A tradition of Excellence

### Other Products Now Available

**WAAPDSUT** — The Programmer Productivity Aid  
**SPLITTER** — The SYSOUT Control System  
**STANFAST** — The Standardized Subroutine Package

For more information on how SAC can benefit you call toll-free: 1-800-527-0128 in Texas call: 1-800-442-5791, or write:

Electronic Data Systems Corporation  
7171 Forest Lane  
Dallas, Texas 75230

## Letters

### Unkind 'Tribute'

I wish to respond to P.A. Anderson's comments regarding "ego-filled" programmers [CW, Aug. 18].

My own observations of programmers' behavior over the years and their attitudes toward themselves lead me to believe that Anderson's requirements for more ego-filled programmers has been fulfilled. Programmers in general seem to have pride in their work, but pride in one's skills and "ego-filled" are in my view two different things.

We all know some turkeyes who believe they are in the business by Divine Providence.

According to them, they are the embodiment of structured perfection. Topdown excellence. Their attitude goes far beyond pride in their skills.

These people tend to embrace a view in which everyone is wrong except themselves.

This is not healthy, either psychologically or sociologically.

To imply that the likes of Edison, Einstein, Bach and Wright and any programmer who walks the face of the earth have anything of note in common is truly the unkindest tribute one could pay to those four notables.

K.M. Maadson  
Palo Alto, Calif.

### WAREHOUSE CLEARANCE KEYPUNCHES

|             |       |
|-------------|-------|
| IBM 029     | \$995 |
| Rebuilt 029 | 500   |
| Economy 029 | 350   |
| IBM 026     | 250   |
| TAB 410     | 995   |

DATA RENTALS/SALES, INC.  
Los Angeles, CA 213/559-3822  
San Francisco Area  
415/697-4911  
Outside CA 800/421-4505

# Now you can get a used computer from Digital that's built like a new one.

Digital offers a way to give you both the security of a new computer and the savings of a used one. With Digital's Factory-Refurbished Equipment.

Digital's factory refurbishing starts where ordinary used computers end. Every single product is thoroughly inspected. Diagnostic tests are run. And if anything needs replacing, it's replaced.

But we don't just bring the equipment up to par. We bring it up to date, by adding the latest technology available for the product. So it will actually run as well as when it was new.

Just to make sure we've done our job, Digital quality assurance experts do theirs. They examine the records. Check the revisions. They even do the same inspection on refurbished equipment that they do on new equipment. They have to. Because all Factory-Refurbished Equipment from Digital comes with full documentation and a Digital warranty.

In fact, the only way to tell the difference is to look at the price.



## Introducing Digital's Factory-Refurbished Equipment.

You can get Digital's fully warranted, fully upgraded Factory-Refurbished Equipment at a substantial savings over the original list price.

So if you're considering used equipment, consider the only used equipment that looks and runs like new. Digital's Factory-Refurbished Equipment.

To learn more about PDP-8, PDP-11, or any Factory-Refurbished Equipment from Digital, call toll-free 800-258-1728 (in New Hampshire, Alaska and Hawaii, 603-884-7240). Or send the coupon.

- ☐ Please send me your buyers' guide to Digital's Factory-Refurbished Equipment.
- ☐ Please have a sales representative call on me.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

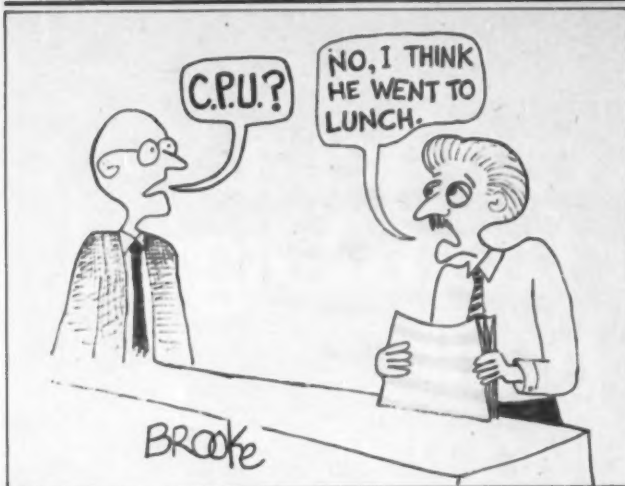
State \_\_\_\_\_

Zip \_\_\_\_\_

Digital Equipment Corporation, Traditional Products,  
522 Amherst Street, Nashua, NH 03063.

B-9-08-0

digital



## Contractors Often 'Fit'

(Continued from Page 33)

prior to beginning any work assignment, not to disclose any financial (or other) arrangements, most staff resentments of this type don't need to happen.

I think many staffers are also aware that, though the contractor makes, in many cases, more money than they do, often for the same type of work, the contractor is on the job site only temporarily and doesn't share in benefits, amenities or promotional opportunities companies provide to their regular employees.

Insofar as incomplete (or nonexistent) documentation is concerned, as a criticism "directed most often" at contract programmers, I think this is an-

(while the project is being completed) to ensure that instructions are being implemented as the user originally intended.

Contracting is a two-way street between the programmer and DP management; without constant dialogue, even if that dialogue consists of written and cosigned specifications, both management and contractors will spend more time and energy playing "caveat emptor" (and PMA) than turning out productive work. At the bottom line, it is the prime responsibility of the user to determine that documentation, as required, is adequate during the assignment of any contractor; if not, the user should immediately discharge the contractor in the event

*'Contracting is a two-way street between the programmer and DP management; without constant dialogue, even if that dialogue consists of written and cosigned specifications, both management and contractors will spend more time and energy playing "caveat emptor" than turning out productive work. At the bottom line, it is the prime responsibility of the user to determine that documentation, as required, is adequate during the assignment of any contractor.'*

other potshot at the professionalism and integrity of the group as a whole. Do contractors leave their clients in any more of a lurch than do captive employees who have been recruited by other companies or employment agencies?

I suspect one has to look at the nature of the beast in order to begin to answer the question. Many applications programmers, contract or captive, don't enjoy doing what they consider to be "demeaning" work such as documentation or maintenance. Yet this work must be done in order to have an effective DP installation. To alleviate the problem of undocumented work (insofar as contractors are concerned), the smart DP manager will clearly define what documentation is necessary, before the work is begun, then consistently interface with the programmer

an acceptable solution cannot be reached and mutually understood.

Any contract programmer's job qualifications and professional competence standards are, in my opinion, as easy to verify as those of any potentially captive employee — perhaps easier. To check the references of most prospective employees, the company providing the reference must generally comply with certain laws and internal policies of disclosure, often limiting the "reference check" to not much more than confirmation of employment.

When checking out a potential contractor, the user merely need ask where he has worked, what he did, when and for whom; then, it's usually a matter of simply calling that previous technical manager to verify ability, reliability and overall satisfaction. Who forgets many \$30+/hour contractors?

Often, because a contractor has "job-hopped," there's the real possibility that his background (typically, a good mix of hardware, software and applications) could be superior to that of newly hired employees. Getting the contractor up to speed, in many installations, requires only minimal orientation.

The suggestion that some, if not all, installations use only contractors (other than the exception of key senior personnel) could, in some cases, be wise, especially for the large-scale shop with many programmers, in a maintenance or fire-fighting environment.

For the shop engaged primarily in design and/or development, the role of contractors could still be as effective, especially in environments where most projects are under specific deadline and the utilization of captive employees, after completion, isn't as certain.

In summary, using contractors, whether they're free-lance, subcontract, "quasi" or consultants, can be meaningful and rewarding to most DP installations as long as management clearly understands what is needed to be accomplished, at what point and the skills required to do it.

Bodman is regional manager for Sigmatics in Los Angeles.

### OBS WYLBUR = INCREASED PRODUCTIVITY

FOUR PACKAGES IN ONE TO DECREASE DEVELOPMENT AND TEST TURNAROUND TIME:

- On-line program development
- On-line production job scheduling
- Document formatting
- Interactive word processing

PRICED 30-50% BELOW COMPETITIVE SYSTEMS. WYLBUR HELPS YOU ATTRACT AND KEEP THE BEST PROGRAMMING TALENT. CONSIDER THESE FEATURES:

- Fast and flexible full screen cursor editing
- Job submit, control and output retrieval
- Dataset maintenance
- Interactive command language
- One- to three-second response time
- A forgiving syntax
- VTAM support
- Low resource consumption

FOR MORE INFORMATION OR A FREE TRIAL CALL (415) 391-9555

\*WYLBUR is a trademark of Stanford University



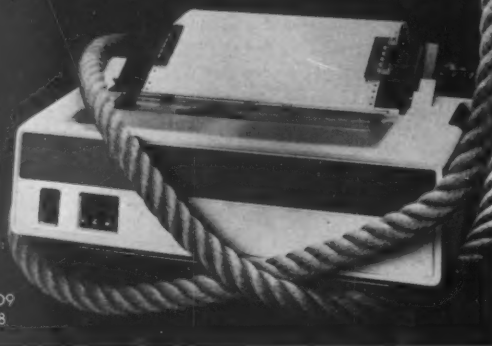
**ON-LINE BUSINESS SYSTEMS, INC.**  
115 Sansome Street, San Francisco, California 94104

## CICS Users: AXIOS Knows the ROPES™ When It Comes To Online Printing

- Reliable, effective operation of printers
- Online and Batch report generation and retrieval
- Special forms processing
- Complete recovery from CICS and printer outages
- Flexible routing of reports
- RSTU (available separately) allows JES/SYSOUT Printing

AXIOS Products, Inc.  
2364 Middle Country Road  
Centerarch, NY 11720  
Phone: (516) 588-5461

In Europe Contact:  
Ordilog  
10 Rue Auber  
Paris, France 75009  
Phone: 226-67-88





## Enhances TCSC Products Nixdorf Launches Software Offerings

By Marcy Rosenberg  
CW Staff

RICHMOND, Va. — Three months after Nixdorf Computer Corp. acquired The Computer Software Co. (TCSC) [CW, May 26], the product of that union — Nixdorf Computer Software Co. (NCSC) — has brought out its first software offerings to the IBM and compatible mainframe market.

While not new products, the announcements come in the form of updated versions

of several system software products that were part of TCSC's line before it was acquired.

Among these NCSC announcements are new releases of the Edos/VS operating system and its associated data base management system and data dictionary; an enhanced version of the Extended Console System (Econ); and a CICS interface for the Data Entry Control System (DEX).

Edos/VS is an operating system based on

IBM's DOS/VS Release 34 for 360, 370, 4300 series and compatible mainframes. Features added in this latest Edos/VS Release 1.2 include 3330-11 disk support, Isam support for 3330-11 users, priority channel scheduling for increased I/O processing speed, and cross-partition enqueue/dequeue and GETVIS for real systems.

In addition, Release 1.2 enhances IBM 370/155-1 support for error recovery and provides an execution frequency monitor for all transients, phases and programs, according to Mike Youmans, NCSC product administrator.

Logical Transient Area (LTA) scheduling was also improved so that LTA is no longer served on a first-in, first-out basis. Instead, programs using LTA are temporarily promoted to high-priority to eliminate contention, Youmans said.

Edos/VS for IBM 370 and 4300 series processors can be licensed for \$8,500; a single-charge license for the 360 version costs \$13,500. NCSC also offers a VS operating system package for \$27,500 that includes 360 and 370 versions of Edos/VS, spooling, supervisor extension and 12-partition support.

### NCSC Database

Available along with enhancements to this operating system is Release 7.1 of the NCSC Database, a data base management system (DBMS) that runs on Edos/VS.

(Continued on Page 48)

## Candle Unveils CICS Monitor, Add-On Analyzer for MVS

MARINA DEL REY, Calif. — A software program that monitors CICS activity through an IBM 3270-type CRT terminal, a response time analyzer that tracks IBM CICS transaction response times and an add-on analyzer for IBM MVS systems that can be used to determine the cause of program bottlenecks have all been recently introduced by Candle Corp.

Omegamon/CICS provides information on CICS activity for operations, systems programmers and managers. On-line information is displayed in real-time through a CRT in two modes of operation. In the transaction mode, the monitor functions as a CICS transaction. In the dedicated mode, a higher level of communication is used to the CRT to provide increased availability, a spokesman claimed.

The CICS monitor reportedly provides the user with dynamic screen formatting and screen space function. More than 20 commands can be used to display information relating to CICS tasks. In addition, the system displays monitor transaction rate, Vsam and file data and internal CICS control blocks.

### Degradation Analysis

Omegamon/CICS also incorporates a feature called degradation analysis that will analyze the cause of CICS slowdowns. The analysis is provided over both short-term and long-term intervals, the spokesman said.

The response time analyzer (RTA) is an optional add-on to Omegamon/CICS and displays data in real-time using the transaction or dedicated modes provided by

Omegamon/CICS. Response time data is monitored in terms of transactions or by user-defined groups of transactions. In addition, the computer's response times may be shown across two time dimensions: re-

(Continued on Page 48)

## System-80 Runs On DG, DEC Gear

PITTSBURGH, Pa. — System-80, the on-line Cobol program generation system, is now available for users of Data General Corp. and Digital Equipment Corp. computers, according to its vendor, Phoenix Systems, Inc.

System-80 reportedly works off key words in a data dictionary to produce efficient Ansi '74 Cobol code to perform whatever functions are necessary in a program, according to a company spokesman.

The system is said to eliminate time-consuming manual error-and-syntax checking and redundancy inherent in any Cobol program. In addition, System-80 allows lower level programmers to do high-level programming tasks, the spokesman claimed.

The full System-80 is available to users of DG's Advanced Operating System for a one-time cost of \$19,500, to users of DG's CS Systems for \$12,675 and to Decsystem-10 users for \$29,250. Functional modules of System-80 start at \$2,500 for DG-AOS users, \$16,250 for DG-CS users and \$3,750 for Decsystem-10 users.

Phoenix can be reached through P.O. Box 7849, Pittsburgh, Pa. 15215.

## Data Catalogue 2 Gets Loading Aid

BEDFORD, Mass. — Users of Synergetics Corp. Data Catalogue 2 can now make use of the firm's IMS and DL/1 Convert feature to aid in loading their data dictionaries.

The feature reportedly allows users to call for automatic scans of existing control blocks or library entries of these control blocks. The function is said to read both Data Base Definitions (DBD) and Program Specification Blocks (PSB).

The function then takes the direct source entries and produces a work file and a printed audit conversion report. The report serves as an audit trail of the control blocks being processed and can also include error

(Continued on Page 48)

# SOFTWARE & SERVICES

## IBM DOS USERS DOSSIER FOR YOUR 4300

"We will use DOSSIER as our major tool in converting to the new 4300."

"DOSSIER will make the conversion much easier by identifying standards and finding the correct name for each file."

"After conversion to the 4300, DOSSIER will continue to help us efficiently manage our libraries...."

"We are extremely delighted with DOSSIER—it's a very fine product."

Send me more information about DOSSIER



Debby Schumann, System-80 Programmer, Purity Supreme Supermarkets, Massachusetts.

Debby Schumann had been managing her program libraries manually, until she acquired DOSSIER. Not only does DOSSIER automate her library management, it will be an excellent tool to help her convert to the 4300.

DOSSIER goes beyond source library documentation to translate object code from program libraries into complete and current program and file information. Its 16 management reports address all aspects of controlling and auditing object libraries.



Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State/Zip \_\_\_\_\_

Telephone number \_\_\_\_\_

**DOSSIER™**  
Documentation &  
Standards Tool  
a product of



For more information, just clip this coupon and mail to Computer Concepts, Inc., 6443 S.W. Beaverton Highway, Portland, OR 97221. Or call 503/297-4741.

# HP 3000

## HARDWARE AND SOFTWARE

- **SUCCESS-PROVEN PACKAGES** installed and supported by their developers, Hewlett-Packard and Data Systems for Industry
- **FIXED PRICE AND SCHEDULE** with hardware-software discounts and leasing available to qualified customers
- **INTERNATIONAL SUPPORT FROM OFFICES IN —**  
Los Angeles      New Jersey      Dallas      Europe

**ACCOUNTING**

- Payroll, Personnel
- Labor Distribution
- Accounts Receivable
- Accounts Payable
- Fixed Assets
- General Ledger

**MANUFACTURING**

- Order Entry
- Bill of Material Processing\*
- Inventory & Order Status\*
- Master Scheduling & MRP\*
- Shop Floor & Capacity Control
- Job Costing

(\*MM/3000)

**DISTRIBUTION**

- Order Entry
- Multi-Inventory
- Shipping
- Billing
- Replenishment Planning
- Distributed Processing

**DISCOUNTS AND LEASING**

- Up to 24% volume discounts on hardware-software systems sales
- Leasing available for hardware-software system sales

### DATA SYSTEMS FOR INDUSTRY

3450 E. Spring Street, Long Beach, CA 90806  
(213) 595-8741

## DATA BASE SEMINARS

### SERVICE ANALYSIS™

Developed by PDC in 1972. It is the proven, structured approach to the task of requirements definition for a data base system project.

NYC/Sept. 24-25  
Houston/Oct. 1-2

San Francisco/Oct. 22-23  
Wash., D.C./Oct. 29-30

### DATA ADMINISTRATION/DATA DICTIONARY

For distributed or centralized data base users. For the use of Data Dictionary in the administration of application systems for both Data Base and non Data Base applications.

NYC/Sept. 22-23  
Houston/Sept. 29-30

San Francisco/Oct. 20-21  
Wash., D.C./Oct. 27-28

Call the **PDC DATA BASE HOTLINE™** for more information and to register.

**800/257-5144**  
(in N.J. 609/921-3770)



**Performance Development Corporation**  
1101 State Road Bldg. P Princeton, N.J. 08540

## Nixdorf Launches Offerings

(Continued from Page 47)

This latest DBMS release is said to allow concurrent operation of most utility functions and to use partition memory in a dynamic fashion to simplify data base program operation.

NCSC restructured the index architecture in Release 7.1 to reduce channel utilization and improve throughput rates, Youmans noted. In addition, several utility programs have been modified.

For example, the recovery utility, which manages the transaction journal file, now allows more precise specification of backout processing requirements and expanded Database trace tables for debugging and helps users bring applications back to production status more quickly, the vendor claimed.

A generalized multithread interface in Release 7.1 is said to simplify data base access through any batch inquiry system that will support a CALL feature and through such teleprocessing monitors as IBM's CICS, Westinghouse Electric Corp.'s Westi and Mathematica Products Group's MPGSwit.

A single-charge license for NCSC Database Release 7.1 costs \$30,000; a multiuser facility must be licensed separately for \$8,000. NCSC Database can only run under Edos/VS.

### Datadictionary

Edos/VS is also necessary to run NCSC Datadictionary, a new version of which is now available from the firm. Called Release 2.1, this latest version includes an input creation facility that accepts record definitions from existing librarian systems to create data dictionary information.

Other features added include support for user-defined entity definitions, the ability to model new information along existing characteristics and provisions

for keeping historical records of changes as audit trails. A single-charge license costs \$12,500.

Release 2.0 of Econ was also announced. This new version, which operates under DOS and DOS/VS as well as Edos and Edos/VS, supports magnetic ink character recognition for operating systems executing in extended control mode.

It also supports the IBM 3270 Model A2 console device for the 4300 as well as the 125D CRT display unit used on 370/115 and 125 processors. These are in addition to the previously supported IBM 1052-, 3210-, 3215- and 3270-type console devices.

A new Timeout feature, when used with automatic console transfer, is said to automatically log off a terminal from Econ if no input activity has occurred within a specified time.

In addition, Release 2.0 allows users to assign single characters — A through Z, 0 through 9, #, @, and \$ — to canned messages, thus adding 39 more functions to the 36 that previously were available through programmer-defined PF and PA keys, Youmans claimed. Econ Release 2.0 can be licensed for \$5,500.

### CICS Interface

Finally, NCSC announced a CICS interface for its data entry system, DEX, which formerly was a stand-alone system only. DEX-CICS runs under the CICS standard or CICS/VS telecommunications systems, the firm said.

Available for a single-charge license fee of \$6,500, DEX-CICS provides editing facilities and can perform data entry, verification, browsing, autoduplication, batch totals and check-digit generation, according to NCSC.

All software products can also be licensed for monthly charges from NCSC at 6517 Everglades Drive, Richmond, Va. 23225.

## Data Catalogue 2 'Converted'

(Continued from Page 47)

messages, according to the firm.

The work file is then sorted and consolidated, resulting in a transaction file and a conversion analysis report. After checking the report, one can make direct entries into the dictionary.

An optional renaming facility enables a user to rename selected data entities.

While the Convert feature is a recent addition, the automatic generation of IMS and DL/1 control blocks from scans of the dictionary has been part of Data Catalogue 2 "for many years," according to a spokesman. Both features are part of the Data Catalogue 2 interface for DL/1 and IMS.

The DL/1 and IMS interfaces each cost \$5,000. The basic Data Catalogue

2 for IBM's OS/VS and MVS costs \$14,900 and the DOS/VS and VSE versions are \$12,900 each.

The dictionary is also available for the Univac 1100 at a cost of \$12,900. Synergetics is located at One DeAngelo Drive, Bedford, Mass. 01730.

## Monitors Out For CICS, MVS

(Continued from Page 47)

cent time intervals in terms of minutes, or time slots which would involve specific times of the day.

Finally, Dexan for MVS is a degradation exception analyzer that is said to allow a performance analyst to determine the causes of system slowdowns with specific types of tasks.

The Dexan MVS analyzer costs \$5,000. The Omegamon/CICS monitor has a permanent license cost of \$12,500 that will be boosted to \$15,000 as of January 1981. However, as an added incentive, the first 25 charter customers of Omegamon/CICS will be billed \$9,500. The response time analyzer option is priced at \$5,000.

Candle Corp. is located at Suite 624, 4676 Admiralty Way, Marina Del Rey, Calif. 90291.

## Corrections

The Easytrieve software from Pan-sophic Systems, Inc. now available on Univac's VS/9 operating system offers an unlimited sequential input/output option, not unlimited sequential files [CW, Aug. 11], the vendor said.

Software Education Corp.'s course, "Vsam for Cobol/Assembler Programmers," will be held Sept. 15-19, not Sept. 9-19 [CW, Aug. 18].



# Cincom Updates Manufacturing Modules

CINCINNATI — Cincom Systems, Inc.'s Manufacturing Resource Planning System (MRPS) software has been enhanced in the area of its Foundation Modules, which include material control, standards maintenance and system control.

Release 2.0 is said to enable the user to maintain more control over the manufacturing environment. Specifi-

cally, it allows monitoring inventory by location, better system control for transactions and auditing procedures and expansion of the data base to include product costing, production routings and work centers, Cincom claimed.

Within the enhanced Foundation Modules is the Material Control Module, which gives the user the capability

to define multiple inventory locations, including major and minor locations such as warehouse, stockroom, bin, row and shelf. The system then monitors inventory activity against these locations, according to the firm.

Within the Standards Maintenance Module, Release 2.0 is said to expand the MRPS data base to enable the user to maintain the portion of the data base supporting production routings and work centers.

This feature is important, the vendor claimed, because: It is required for standard cost support; it is required by the new MPSS and PPCS modules; it allows current users to begin now to store data needed for activation of future modules.

Cost data is maintained for material, labor and overhead on both an accumulated cost and an incremental cost basis. This breakdown in cost is beneficial in determining the real effect of a cost increase at any level of the production process, a company spokesman said.

The System Control Module allows the user to control parameters that establish the framework of operation of the system. Global parameters, such as purge control, nervousness dampers and rate tables are controlled by the user.

The Foundation Modules are available for a one-time license fee of \$50,000. Cincom Systems, Inc. is located at 2300 Montana Ave., Cincinnati, Ohio 45211.

## Synergistic Packages Run In TI Basic on TI 990 CPUs

E. THETFORD, Vt. — Several software packages for the Texas Instruments, Inc. 990 CPU series in TI Basic, each with user manuals and demonstration disks, are being offered by Synergistic Systems.

The Mail-990 mailing list program maintains up to 10,000 addresses per diskette. The Text-990 text editor provides screen-oriented text preparation functions for documents of up to 400 lines. Index-990 multikey indexed sequential-access routines provide instant access to any record in a file by up to five different keys, and sequential access in key or reverse key order.

Forms-990 is a package of functions and subprograms which simplify the development of forms-oriented input routines. The Info-990 interactive data base system enables office personnel to create and maintain a variety of data bases by menu specifications.

Mail-990 costs \$500, Text-990 costs \$100, Index-990 with source code costs \$800, Forms-990 costs \$500 and

Info-990 costs \$800 from Synergistic Systems, Cobble Hill Road, E. Thetford, Vt. 05043.

## 'Ramis II' Added To MMDS Net

BETHESDA, Md. — Martin Marietta Data Systems (MMDS) has expanded its time-sharing services network with the addition of Ramis II, a decision support software system for nontechnical users.

The product combines a data base management system with an English-like language geared for the business vocabulary of the nontechnical user. Ramis II enables new applications to be implemented five times faster and reports 40 times faster than do conventional computer languages such as Cobol and Fortran, MMDS claimed.

Prices for the system vary broadly, but are based on computer time, priority of service and the particular customer configuration, MMDS said from 300 E. Joppa Road, Baltimore, Md. 21204.

## Course Cassette Out

ARVADA, Colo. — Educassettes, Inc. has announced the release of File Merges, the second module of the Model Program Series.

Utilizing the Warnier-Orr program design technique, this self-study audio cassette course traces the development of a generalized design for file merges.

The course, with illustrated workbook, is priced at \$59. Discounts are available for quantity orders, Educassettes said from Suite 102, 6777 Wadsworth Blvd., Arvada, Colo. 80003.

# WHERE WOULD YOUR HARDWARE BE WITHOUT SOFTWARE?

Your hardware would be in the dumps without exceptional system software to guarantee maximum productivity.

Nixdorf Computer Software Company (NCSC) is a world leader in system software for users of IBM System/360, 370, 4300 and plug-compatible computers.

The many software products NCSC has designed to improve your installation's productivity include EDOS/VS—an operating system with increased productivity over IBM DOS/VS and DOS/VSE; PDMS—an online programming

system; ECON—an enhanced console system with interactive facilities; NCSC Database and NCSC Datedictionary—an efficient data base management system; and DEX—an online data entry system.

Productivity through better software is what NCSC is all about. You owe it to yourself to keep your hardware out of the dumps and running at maximum efficiency. Contact any one of our offices to obtain more information and to schedule an installation in your operation.

## NIXDORF COMPUTER SOFTWARE COMPANY

Richmond 804/276-9200, Los Angeles 714/634-0733, Chicago 312/635-6310, Dallas 214/247-2004.

**NIXDORF**  
COMPUTER





## Pascal Updated For DG Gear

NEW YORK — Rational Data Systems, Inc. (RDS) has announced its Release 2.10 of Pascal for Data General Corp. computers. This latest revision of RDS Pascal features facilities for assembler interface and the separate compilation of procedures and functions, RDS said.

RDS Pascal is the only Pascal available for all DG disk-based systems, a spokesman claimed. The one-time license fees are \$2,500 for the RDOS version and \$3,500 for AOS.

The details of the assembler interface to RDS Pascal are explained in the third issue of "RDS Pascal Newsletter." RDS is located at 245 W. 55 St., New York, N.Y. 10019.

## Bookkeeper Fits TI Machines

RALEIGH, N.C. — Business Application Systems, Inc. has announced an upgrade to its BAS Bookkeeping System, a five-module software package for first-time users.

Designed to automate payroll, inventory, general ledger, accounts receivable and accounts payable, the BAS Bookkeeping System is available on Texas Instruments, Inc., floppy disk terminals 771 and 990/1, 990/4, 990/6, 990/8, 990/10 and 990/12, running under the DX10 operating system.

Both hardware and software are available from the firm. Hardware prices range from \$27,000 to \$100,000. The software package costs \$4,000 from 7334 Chapel Hill Road, Raleigh, N.C. 27607.

## Package Integrates Medical Data

KING OF PRUSSIA, Pa. — Shared Medical Systems Corp. has added a management reporting package to its general ledger package.

The package integrates complete financial information with statistical information in one data base. Patient billing, payroll, census and inventory data is automatically fed into the general ledger, the firm said.

The shared batch system, with the general ledger and management reporting packages, costs \$225 a month plus an additional 10 cents per patient-day. Current users can add the management reporting system for an additional 4 cents per patient-day, the firm said from 650 Park Ave., King of Prussia, Pa. 19406.

## Dictionary Uses Listed

LEXINGTON, Mass. — A 125-page book about data dictionary applications is available from MSP, Inc.

The *Data Dictionary in Systems Development* consists of a general overview of the topic and seven presentations on associated subjects given at Datamanager user group meetings.

While the only data dictionary specifically identified is the Datamanager, the book is said to contain information on concepts and implementation approaches that could apply to any data dictionary system.

The book costs \$15 from 21 Worthen Road, Lexington, Mass. 02173.

# At INCO,

# ADABAS

**Inco's DBA tells why ADABAS, Software AG's data base management system, was chosen for the expanding needs of this international firm.**

**Exceptional flexibility, easy maintenance**

"During the development stages of our many application systems, the specifications often changed. We were constantly adding fields and files, or changing their locations in the data base. With ADABAS, these changes are very simple to make. There are no cumbersome chain pointers, so relationships can change according to need.

"Five years ago, we chose ADABAS from Software AG as our data base management system. We demanded a highly flexible, end-user oriented DBMS that would facilitate the development and operation of our business systems. We did not have the time to design our own DBMS, or the luxury of selecting a system that would require a large staff to implement and support. We needed an easy-to-use package with the design phase already accomplished. The available studies indicated to us that ADABAS would be the best choice for our needs. Five years of experience showed us that the studies were right — and so were we in choosing ADABAS."

"In fact, we are continuing to modify our systems to meet our expanding corporate requirements. And with ADABAS, we can make these necessary changes with little or no impact on the hundreds of batch and online programs supported by the DBMS."

**Cost-effective new program development**

"In planning new applications, we do not have to include the high cost overhead for restart/recovery, security, or data base



# we demand adaptability and ease-of-use in our DBMS delivers!



Michael Berman, Corporate Data Base Administrator

INCO LIMITED is a diversified company engaged principally in primary metals, formed metal products and electrical energy products.



loading. These utilities are all included in ADABAS already. Applications programming is faster and easier, too – because ADABAS provides the tools. This means we can concentrate on the application problem – not the data base.

"ADABAS gave us a powerful end-user query language – ADASCRIP+, an interactive report generator – ADACOM, and an online Data Dictionary all in the same package. And recently we have added NATURAL, Software AG's instant applications language, which we expect will decrease development time. Furthermore, the ADABAS system can be fully installed in a single day!"

## High company-wide productivity

"ADABAS is up and running at Inco 18 to 20 hours every working day. The system is used daily by literally hundreds of end users and programmers alike. Each day, our New York installation processes more than 400,000 data base commands from departments like accounting, personnel, marketing, customer information, shipping and billing. With all this intense activity, ADABAS is supported by only three people: a data base administrator, a data base analyst, and a data dictionary analyst."

## ADABAS: Datapro Honor Roll winner for three years

At Inco, ADABAS has cut both program development time and cost. In fact, the exceptional ease-of-use of ADABAS, combined with its outstanding throughput efficiency and adaptability, helped give this product such a high user rating that ADABAS has been nominated to the Datapro Honor Roll for three consecutive years.

If you'd like to know more about how ADABAS met Inco's demand for a truly adaptable DBMS, send for Software AG's ONLINE report today. You may find that ADABAS is the ideal data base management system for a demanding company like yours, too.

**SOFTWARE AG**  
OF NORTH AMERICA, INC.

Reston International Center  
11800 Sunrise Valley Drive, Reston, VA 22091  
(703) 860-5050

Please send me more information on ADABAS, including ONLINE, Software AG's special user report on INCO's success with this unique DBMS.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Telephone \_\_\_\_\_  
Type of Computer \_\_\_\_\_  
Operating System \_\_\_\_\_

## Cobol Precompiler Designed To End Redundant Coding

RED WING, Minn. — A Cobol compiler designed to eliminate redundant program coding has been introduced by Twin Oaks.

SPRCBL, the precompiler, uses propagation, abbreviation, generation, substitution and alignment to reduce the time it takes to produce an average program by one-half, the vendor claimed.

For instance, data name propagation eliminates the need to rewrite the data name in the object of a move or data transfer statement, and paragraph name propagation reproduces the body of the name throughout multi-paragraph routines, a spokesman said. Input to and output from SPRCBL can be card, tape or disk. It has been

installed on Burroughs Corp., IBM, Data General Corp. and Hewlett-Packard Co. computers.

The product is available for a 30-day trial and can be leased for \$50/mo or \$1,250 perpetually, the vendor said from 269 Cannonview Drive, Red Wing, Minn. 55066.

## On-Line Package for System/34, System/38 Aids Manufacturers

SANTA ROSA, Calif. — Data 3 Systems, Inc. is offering MRPS 34/38, an on-line manufacturing resource planning package for IBM's System/34 and System/38 processors.

## 'Screen Builder' Runs On DEC VT-100 Terminal

DENVER — A data entry and forms management aid for application programmers has been announced by Talant Associates, Inc. Written in Basic Plus-2 and Macro-11 and running under the RSX-11M operating system with RMS-11K on Digital Equipment Corp. PDP-11 minicomputers, Screen

Builder runs interactively on DEC's VT-100 terminal.

Screen Builder was designed to increase programmer productivity by decreasing the significant amount of time required in the repetitive coding of screens and forms, according to the vendor.

It reportedly is effective in formatting question and answer, menu, inquiry, output or fill-in-the-blank type forms. The price of \$3,200 includes the Screen Builder modules and a disk resident Screen Builder Library.

The firm is located at Suite 308 S., 3010 W. Sixteenth Ave., Denver, Colo. 80204.

## Basic Four Minis Get 'Omnicdata'

STERLING, Va. — Berman Associates has announced an interactive data management package for Basic Four Computer Corp. minicomputers.

Omnicdata handles list-oriented data such as mailing lists, personnel files and inventories.

The package costs \$1,995 from Berman at 101 E. Holly Ave., Sterling, Va. 22170.

## GE Updates PC/70 for Geisco

PHILADELPHIA — The latest version of PC/70 for Geisco, General Electric's time-sharing service, is available from Atlantic Software, Inc. PC/70 is a project resource management information system.

Critical path methodology, a processing and interactive reporting feature for tabular and bar-chart graphic reports, has been added to the package.

### Report Retrieval Enhanced

On-line Report Retrieval has been enhanced to permit page alignment with CRTs and teleprinters ranging from 80 columns by 24 lines to 132 columns by 66 lines and every combination in between, a spokesman said.

The price of PC/70 is based on resources used. Atlantic reports its average customer spends \$1,800/mo. New users must also attend a two-day training course in Philadelphia for a charge of \$300 per attendee.

If desired, the course will be taught in-house for \$2,000 plus travel and expenses, the vendor said from Lafayette Building, 5 and Chestnut Sts., Philadelphia, Pa. 19106.

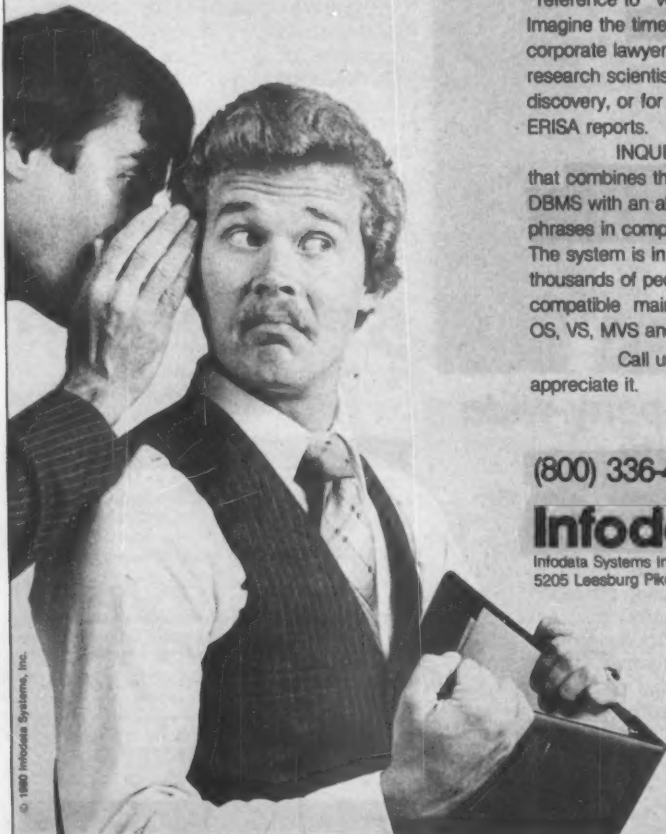
## Newsletter Publishes Listing of Software

BETHESDA, Md. — A listing of software publishers and the types of programs they buy is being started by the Computer Consultant newsletter/directory.

Free-lance programmers who want to sell software they have written or who are trying to gauge the market for particular software will now have a reference guide on who's buying what, the publisher said.

More information is available from Battery Lane Publications, P.O. Box 30214, Bethesda, Md. 20014.

## "INQUIRE<sup>®</sup> does Text Searching Too!"



The secret is out. Infodata has coupled a complete text and document searching system into the INQUIRE database management system.

Suppose you want to know if anyone has ever written a report on "vertical marketing."

INQUIRE/TEXT can search every written word on file and give you the exact location and context of every reference to "vertical marketing." Imagine the time savings for your corporate lawyers' litigation support, for research scientists on the brink of discovery, or for those EEO, OSHA or ERISA reports.

INQUIRE is the only system that combines the best qualities of DBMS with an ability to find words and phrases in computerized documents. The system is in use today by thousands of people on major IBM and compatible mainframes running under OS, VS, MVS and CMS.

Call us today. Your users will appreciate it.

(800) 336-4939

**Infodata**

Infodata Systems Inc.  
5205 Leesburg Pike • Falls Church, Virginia 22041



## COM Tool Frees CPUs From Converting Output

ANAHEIM, Calif. — A computer output microfilm (COM) software package that is said to free the CPU from having to convert data intended for line printer output has been introduced by California Computer Products, Inc.

The Microfiche Management Software (MMS) is an assembly language program designed for the Model 930 off-line controller driving a Calcomp Model 1681 high-resolution COM printer/plotter. The program can be modified by Calcomp to be compatible with most host computer systems, a spokesman claimed.

MMS is provided on floppy disk and accepts CPU-generated information on any standard 9-track 800- or 1,600 bit/in. tape in either NRZI or phase-encoded format. Output can be 105mm microfiche or 16mm film.

Subroutine features of the software include the ability to produce index pages, eye-readable titling and fiche and column breaks. All of the subroutines are geared to respond to operator-selected parameters.

Finally, the software provides continuous flashing of the CRT image and the hardware form, letting the operator align data with the form while viewing both displays.

The MMS package costs \$3,600 on a one-time lease and can be obtained from Calcomp at 2411 W. LaPalma Ave., Anaheim, Calif. 92801.

## Broadcasting Package Designed for IBM 5120

OPELIKA, Ala. — Datacount, Inc. has introduced a software package for IBM 5120 small business computers that is geared to handle the business and traffic scheduling chores in radio broadcast applications.

The Datacount Accounts Receivable and Traffic Scheduling (Darts) software operates on a 5120 with 32K bytes of memory and includes traffic scheduling with program log generation.

The cost of the system is \$7,500 which includes on-site installation and training, documentation and a subscription to future system enhancements, a Datacount spokes-

woman said from the firm at 2207 Anderson road, Opelika, Ala. 36801.

### Researcher Aided

SHAWNEE MISSION, Kan. — The Customer Satisfaction Research Institute (CSRI) has added a statistical processing service to its line of DP services.

Called Accutab, the no-charge in-house addition offers CSRI clients quick turnaround of questionnaire and survey analysis data.

The vendor is at Suite 107, 4901 College Blvd., Leawood Manor/Shawnee Mission, Kan. 66211.

## Enhanced Ansi '74 Version

## RJ-11 Cobol Runs on PDP-11s

SUDBURY, Mass. — RJ-11 Cobol, an enhanced Ansi '74 standard version for Digital Equipment Corp.'s RT-11 operating system, is available from EEC Systems.

Consisting of a compiler, run-time system and supporting programs, it runs on DEC PDP-11 computers.

The product was designed for small business applications and combines the advantages of Cobol with relatively inexpensive hardware, such as

floppy disks, the vendor said.

The language implementation includes: INSPECT, STRING and UNSTRING verbs; SORT verb; condition names; COMPUTE verb; complex conditions; expressions; program chain and overlay functions; 16 decimal places of arithmetic accuracy; COPY verb; and character, packed-decimal and binary representation of data.

RJ-11 Cobol also features several facilities not available

in the Ansi standard such as provisions of two types of indexed-sequential files suitable for different applications and two different techniques for processing files with variable length records, suitable for different file devices, the vendor claimed.

Also available is an interactive, dynamic debugging facility for tracing the operation of programs and automatic line counters to simplify report generation.

In addition, utility programs are provided to print the contents of files or program results; sort files; create files; update files; print file details and extend files.

The product is priced at \$2,500, the vendor said from 315 Goodman's Hill Road, Sudbury, Mass. 01776.

## Restaurant Software Geared To Point-of-Sale Systems

LOS ANGELES — A software program for the food service industry and tailored to point-of-sale management control systems with non-printing remote terminals has been developed by AM International's Documentor Division.

Users can record and process up to 250 open accounts, record sales made with six types of charge cards and utilize various tax tables stored in memory, the firm said.

Restaurant managers can maintain timekeeping records for up to 100 employees in six payroll categories and monitor revenue and productivity of up to 40 waiters and waitresses. The software provides more than 30 reports covering operations, complete revenue and inventory control, costs of goods, waiter productivity and timekeeping.

Designed for systems using the AM Documentor 3276 remote nonprinting terminal, the software evolved from the 3225M program currently available for restaurants.

The cost for one nonprinting remote terminal is \$5,300 and the price ranges up to \$20,000 depending on the number of

terminals and options purchased, the vendor said from 1900 Ave. of the Stars, Los Angeles, Calif. 90067.

STANDARD TSO COMMANDS  
NO RETRAINING NECESSARY

ASK FOR A FREE TRIAL

**TONE 4 MVS**

HYPER-FORMANCE TSO

**TONE 3**

HIGH PERFORMANCE-LOW OVERHEAD TSO FOR VSI

- Edit with full screen capability
- Internal reader job submit
- Output retrieval with RES support
- System maintenance
- Program development
- 132 column video display
- System debugging
- Text editing
- Performance monitoring support
- Interactive program execution
- SPF support
- Dataset maintenance
- Catalogue management
- Standard IBM TSO commands
- Enhanced 3270 usability
- Full ASCII terminal support
- No user swapping
- VTAM and BTAM Support
- User command interface

WE MADE IBM TSO RUN WITH VSI  
NOW WE'RE MAKING IT FLY WITH MVS

**TONE**  
Software Corp.

Call or  
Write  
for  
Details  
1124 N. GILBERT  
ANAHEIM, CA 92801  
(714) 991-9460  
TELEX 181-592

**300 LPM FOR  
LESS THAN  
\$5000<sup>00</sup>**



- TOTAL SELF TEST
- 13 COMM PROTOCOLS
- DIRECT MODEM HOOKUP
- ULTRA QUIET CABINET
- NATIONWIDE SERVICE
- COMPATIBLE WITH YOUR COMPUTER



**INNOVATIVE ELECTRONICS INC.**

15200 Northwest 60 Avenue, Miami Lakes, Fla 33014  
(305) 558-1591 Telex: 807121 (800) 327-3955

## OEM COMPATIBLE.

Both the capabilities of our computer, and the policies of our company, are geared to helping OEMs grow. For complete information and pricing, call Ralph Marchitti,

OEM Manager, at  
(408) 946-5000  
or write us at  
3003 North  
First Street,  
San Jose, CA  
95134.



**DURANGO**

WE'RE OEM COMPATIBLE.

# FORTRAN USERS WHO DON'T CARE ABOUT COMPUTING COSTS MAY TURN THE PAGE FORTRAN OUTPUT EXPEDITER

Those of you still with us are obviously looking for ways to cut costs. With no further ado we present the

a replacement for IBM's FORTRAN I/O package which executes formatted WRITE statements over three times faster than IBM's.

- Operates on any IBM 360/370/303X, Amdahl, ITCL, or other IBM plug-compatible under OS/VS/MVS/VM/CMS/TSO
- Compiles each format statement only once and bypasses costly IBM interpretation
- No recompilation or change to source code
- Totally user transparent
- Reduces end-user and department costs in-house, at service bureaus, or on time sharing services
- Improves on-line response
- Reduces run times dramatically — a benchmark winner
- Used for over four years at dozens of cost-conscious sites throughout the U.S. and Canada
- Listed on GSA Schedule
- Saves time, Saves money, Pays for itself daily

For additional information send to:  
Massachusetts Computer Associates  
26 Princess Street  
Wakefield, Mass. 01880  
Phone: 617/245-9540

My Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Our CPU is: \_\_\_\_\_

- ☐ Sure, I'd like to have the FORTRAN OUTPUT EXPEDITER for a free trial.

A subsidiary of Applied Data Research, Inc.

## Defines 25 Development Roles

## 'Stradis' Eases Structured Methods

NEW YORK — Improved System Technologies, Inc. is offering a structured methods approach to system development.

The Stradis development

package integrates data flow analysis, structured design, structured programming, structured walk-throughs and top-down development, the vendor said.

Stradis defines 25 roles that must be played during system development, installation and maintenance.

The suggested roles are accompanied by briefings and implementation techniques such as data flow diagrams, the vendor said.

The development aid is also said to improve user involvement in system development and cut down the amount of paperwork usually generated while a system is being built, according to the vendor.

Stradis costs \$25,000, but special prices are available for smaller firms.

Improved Systems Technologies is at 888 Seventh Ave., New York, N.Y. 10106.

## Program Helps Implement Structured Techniques

BOSTON — A program for implementing structured techniques for systems development is available from The Structured Technologies Group.

The program is designed to attack the problems of building systems: low productivity, cost of maintenance, poor communication and inadequate project control.

It focuses on requirements definition, and functional and architectural design.

The approach utilizes structured tools, such as a graphics modeling technique for functional decomposition, a real-time review and validation cy-

cle and dynamic documentation.

The price is based on the size of the analysis staff to be trained, consulting time required and the complexity of the particular project, Structured Technology said from 89 Franklin St., Boston, Mass. 02110.

## Brochure Details Method To Structure Fortran Units

CORPUS CHRISTI, Texas — Comp-Aid Co. has announced the availability of an 84-page brochure that report-

edly demonstrates a new methodology for structuring standard Fortran modules.

Termed Functional Blocks, the methodology is said to permit the user of standard Fortran to achieve modules that are as understandable and maintainable as that claimed by the users of the so-called structured Fortrans.

The brochure, entitled "Structuring Fortran Modules by Functional Blocks: An Overview (and a Comp-Aid Service)," first presents a brief management overview.

The brochure costs \$15 for the first copy, with written permission available to make as many in-house copies as desired. Comp-Aid is located at 3330 Orlando St., Corpus Christi, Texas 78411.

## Oil and Gas Package Fits AM-Jacquard Hardware

OKLAHOMA CITY, Okla. — An oil and gas financial and accounting package for the AM-Jacquard line of hardware is available from Professional Programming Systems, Inc.

Features of the package include general ledger, joint interest billing, revenue disbursements, windfall profits tax, accounts receivable, accounts payable, payroll, lease records, land management and delay rentals.

The package is fully integrated with AM-Jacquard's Type-Rite word processing software and allows increased

personalized communications with investors and vendors by utilizing the firm's shared logic hardware, the vendor claimed.

There are two versions. The AM J500 for smaller companies costs \$12,000 and AM J100 with multiple workstations, printers and network requirements costs \$23,000, the vendor said from 1900 N. MacArthur Blvd., Oklahoma City, Okla. 73127.

## System Processes Auto Policies

PHILADELPHIA — An on-line automobile insurance policy processing system is available from General Data Systems, Ltd. FAM-V Commercial is suited for either distributive processing in field offices or as a completely integrated system, the vendor said.

Running under IBM communications software, FAM-V Commercial automates such facets of the commercial automobile policy writing business as classification and rating, policy insurance, renewals and endorsements, billing and premium accounting and balancing and control reports.

The base price for the system is \$150,000, subject to change with user configurations, the vendor said from 1520 Locust St., Philadelphia, Pa. 19102.

# CCP ANNUAL EXAMINATION

SCHEDULED FOR DECEMBER 13, 1980

The annual examination for the Certificate in Computer Programming (CCP) will be held on December 13, 1980, at selected test centers throughout the world.

Specific requirements for this year's examination are detailed in the "Certificate in Computer Programming Examination Announcement and Study Guide." The study guide and application form for the 1980 examination are available on request from ICCP.

Deadline for Filing Application is October 15, 1980

Please forward the "Certificate in Computer Programming Examination Announcement and Study Guide" along with application and test site list.

Name \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State or Province \_\_\_\_\_ Zip Code \_\_\_\_\_

MAIL COUPON TO: Institute for Certification of Computer Professionals/Certification and Testing Section  
304 East 45th Street  
New York, N.Y. 10017

# COMPUTERWORLD



... the one  
weekly newspaper  
that's designed to fulfill your  
unique "need to know" ...  
the one newspaper that can  
give you all the current  
information you need to benefit  
you, your organization and  
your career progress ...  
52 weeks of incisive news,  
commentary and special  
reports ... subscribe today,  
use the attached postage paid  
order form.

☐ Please enter my subscription  
(details on back)

☐ I'm already a subscriber,  
but I'd like you to  
change my:

- ☐ address
- ☐ title
- ☐ industry
- ☐ other

My current mailing label is attached  
and I've filled in new information  
on the other side

Put old label or label information here



☐ Check Enclosed    ☐ MC    ☐ BA/Viso    ☐ Am Ex

If charge we must have cardholder's signature: \_\_\_\_\_

Expiration Date: \_\_\_\_\_

|               |                |         |       |          |
|---------------|----------------|---------|-------|----------|
| First Initial | Middle Initial | Surname |       |          |
| Your Title    |                |         | State | Zip Code |
| Company Name  |                |         |       |          |
| Mail To:      |                |         |       |          |
| City          |                |         |       |          |

Address shown is: ☐ Business ☐ Home

☐ Check here if you do not wish to receive promotional mail from Computersworld

PLEASE CIRCLE NUMBER IN EACH CATEGORY

BUSINESS/INDUSTRY

10 Manufacturer of Computer or DP Hardware/Peripherals  
 20 Manufacturer (other)  
 30 Service Bureau/Software/Planning/Consulting  
 40 Distribution/Communication Systems/Transportation  
 50 Wholesale/Retail Trade  
 60 Finance/Insurance/Real Estate  
 70 Mining/Construction/Petroleum/Refining  
 75 Business Service (except DP)  
 80 Education/Healthcare  
 90 Government/State/Local  
 95 Other: \_\_\_\_\_

TITLE/OCCUPATION/FUNCTION

11 President/Owner/Partner/General Manager  
 12 Treasurer/Controller/Finance Officer  
 21 Director/Manager of Operation/Planning/  
 Administrative Service  
 22 Director/Manager/Supervisor DP  
 23 Manager/Supervisor Computer  
 31 Manager/Supervisor Programming  
 32 Programmer/Methods Analyst  
 41 Application Engineer  
 51 Office Engineering  
 52 Sales Representative  
 53 Other Sales Marketing  
 60 Consultant  
 70 Lawyer/Accountant  
 80 Librarian/Editor/Student  
 90 Other: \_\_\_\_\_

Address shown is:  
☐ Business  
☐ Home

☐ Check here if you do not wish to receive promotional mail from Computerworld



COMPUTERWORLD  
THE NEWSWEEK FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT. 375 Cochituate Road, Rte. 30, Framingham, MA 01701

Detach here, fold, and place in post-paid envelope attached through binding.

## Links 200 Terminals

# Switched Net Cuts Footwork on Campus

TEMPE, Ariz. — When Arizona State University (ASU) discovered many of its 38,000 students were running from one end of its campus to another to use several computer systems, school officials decided something had to be done.

The obvious solution was a network, but there was a hitch. The University's mainframe population consists of one IBM 370/158, one IBM 3031, three Digital Equipment Corp. PDP-11/70s, a large Univac 1100/42, another PDP-11 network for independent teleprocessing, plus a few smaller PDP-11s dedicated to word-processing applications — and some 200 terminals.

"The problem was in giving students at Site A access to a computer at Site B. It was extremely difficult to assign people to machines and not force them to make long treks across campus or across town to access the other computer systems," according to Darel Eschbach, the school's director of computing. "With a mixed configuration, however modern, you essentially face the same problem you have with batch systems — getting to the computer.

### Two Alternatives

"We knew we could go one of two ways: Either put in an awful lot of terminals and enough copper to string every terminal to every processor or go to a sophisticated switched network. We were also faced with requests to install dozens of additional terminals so that peak loads at the remote sites could be handled.

"The costs of terminals and, more importantly, the cost of space were major concerns," he recalled.

"The added requirement to convert the Univac applications to operate on the Model 158 mainframe — in preparation for switching both the Univac and IBM work loads to an Amdahl Corp. processor — forced our hand," he said.

"Installing a switched network was one of the best decisions we ever made," Lynn Bellamy, Arizona State's assistant vice-president for computer services, said. "The new facility promises students, faculty and administrative users access to all computer resources from any terminal location.

"In addition, it seems to be cutting energy and labor expenditures, reducing communications costs, and greatly increasing message efficiency due to its new message broadcasting capabilities," he noted.

The unnamed network, which is based on an M3200 integrated networking system from Tran Telecommunications Corp., has already been expanded to link over 200 terminals and computer ports to each other, and this number will more than double in the next few months.

Initially installed with a Tran M3201 network processor and six M3211 network access concentrators, the network is taking on a dual-node form with another M3201 processor and four more concentrators.

According to Bellamy, another key consideration in choosing an integrated network was that of pulling essentially all of the security checking out of the hosts, saving that wasted overhead in those machines.

## NCR Net Transfers Financial Data

DAYTON, Ohio — NCR Corp. has unveiled a system designed to help banks reduce the number of paper checks written and cut down on courier services required to transport magnetic tapes containing financial data among businesses, banks and the Federal Reserve System operated automatic clearing house (ACH) communications network.

The Federal Reserve System currently operates ACH networks in every state except New York. The purpose of the network is to electronically transfer financial information.

Payments being sent through the ACH network include Social Security deposits, government payments, insurance premium payments and direct payroll deposits.

While there is direct data transfer among the various ACH facilities, courier services are required to transfer tapes from corporations to their banks and the ACH facilities.

### Detects Data Errors

Besides eliminating the need for courier services, the NCR system, called 74530 ACH, aids in the detection and correction of errors in the data, the vendor claimed.

Using the system, information can be automatically sent from the organization originating the transaction to the bank. The 7530 can then transmit the data directly to the Federal Reserve's ACH.

While acting in a processing and communications mode, it is

"Our experiment determined that the network did all of those things that we wanted it to, including providing increased security," Eschbach said, "and it proved a real boon to the conversion process. Users can begin with an all Univac application mix and convert programs to IBM compatibility one at a time. Their existing DEC LA36 terminals access either machine easily through the Tran network processor.

"Similarly, they can put jobs on the DEC computers in the same manner, since the network has purposely been kept transparent to the applications."

That transparency will always be a valuable asset, Eschbach maintained, but ASU may not always limit its network to data transport services. "The opportunity, with all that intelligence available in the network, is always there for doing other things with it.

able to receive or transmit data without the need for an operator and can be automatically dialed-up by another system. It can communicate with NCR computers or other systems adhering to several different protocols.

A typical system including processor, keyboard, visual display screen, cassette tape unit, magnetic tape drive and communications adapter costs approximately \$16,000, the vendor said from Dayton, Ohio 45479.

## Racal-Milgo Introduces Statistical Multiplexer Line



The Omnimax Series

MIAMI — Racal-Milgo, Inc. is now offering a series of statistical multiplexers designed to provide advanced management and performance features for data communications networks.

The Omnimax series consists of three basic models: Omnimax 80, which offers eight channels; Omnimax 160, with 16 channels and Omnimax 320, a 32-channel unit.

Each is capable of multiplexing a mixture of asynchronous and synchronous data with full protocol transparency, with all channels operating up to 9,600

bit/sec, and with the aggregate link running up to 19.2 bit/sec, the vendor claimed.

Advanced management features include a variety of diagnostics, statistical reporting, remote control and ease of operation. For statistical reporting, data on both individual channels and aggregate links are continuously accumulated and available from local or remote units via the front-panel display.

The price of one eight-channel Omnimax is \$3,850, the vendor said from 8600 N.W. 41st St., Miami, Fla. 33166.

## Data Bits

### RCA Globcom Asks To Extend Telex in U.S.

NEW YORK — RCA Global Communications, Inc. (RCA Globcom) has filed with the Federal Communications Commission (FCC) to extend its direct international telex, telegram and leased channel services to six more U.S. locations, increasing to 32 the number of metropolitan areas to which the company provides direct overseas operation.

The six new metropolitan areas are Anaheim and San Diego in

California; Charlotte, N.C.; Indianapolis; Phoenix; and New Brunswick, N.J.

### IDC Issues X.25 Study

WALTHAM, Mass. — "X.25: The Unknown," a study that reportedly discusses the latest developments in telecommunications standards in layman's terms for the nontechnical executive, has been released by International Data Corp. (IDC).

Researched and written by Ron Frank, a telecommunications consultant and journalist, and

John Gantz, IDC's director of publications and editor of its Distributed Processing Reporting Service, the study explains the evolution of the X.25 standard, discusses differences within the standards world and offers "Who's Who in the Standards World."

The report is part of IDC's Distributed Processing Reporting Service, but is available to non-subscribers for \$125. More information is available from George Pardi at IDC, 214 Third Ave., Waltham, Mass. 02254.

## Terminal Has Touch Pads

NEWTONVILLE, Mass. — A touch-sensitive CRT terminal designed for public access is available from Interaction Systems, Inc. The terminal reportedly simplifies interactive dialogue and eliminates the need for a keyboard.

The screen of the microprocessor-based unit is divided into multiple transparent capacitive touch pads. All switches, adjustments and cable connections are inaccessible to prevent tampering, the vendor claimed.

Equipped with a program-selectable two-page display memory, the Z80-based terminal incorporates a high-resolution 15-in. CRT screen and a 10 by 14 dot matrix. Full upper- and lowercase ASCII character set is standard, and customer specified-fonts up to 240 characters are available.

The price for the terminal is \$2,800, the vendor said from 24 Munroe St., Newtonville, Mass. 02160.

## Ascii POS Terminals Give Interactive Capability

RALEIGH, N.C. — Perry Data Systems, Inc. has unveiled an ASCII asynchronous point-of-sale (POS) terminal that reportedly provides interactive communications POS capability with computer-controlled receipt printing and program control of up to four cash drawers.

The 16-line by 80-char. display

## DG Adds Three Products For Micronova

WESTBORO, Mass. — Data General Corp. has introduced three communications products geared to enhance the flexibility and hardware support of its Micronova MP/100, MP/200 and Micronova board computer (MBC).

The first product, an asynchronous/synchronous line multiplexer (ASLM), has four serial communication lines with modem control. Each of the four lines supports either character-controlled synchronous protocols (including IBM bisynchronous) or asynchronous communications. The device can operate at 19,200 bit/sec in either mode, a spokesman claimed.

The second introduction is a four-line asynchronous interface that is designed for use in network applications or as a terminal concentrator.

All line characteristics of each of the four asynchronous interfaces are said to be fully programmable with a maximum operation speed of 19,200 bit/sec. Line interfaces meet EIA RS-232C specifications, the spokesman added.

Finally, DG unwrapped a communications software package which supports up to eight synchronous communications lines. The MP/OS synchronous communications package (MSCP) supports ASLM on the Micronova.

The ASLM costs \$750 while the asynchronous interface is priced at \$600. The MSCP software sells for \$500 with an initial license and \$100 for a run-time license, the spokesman said from the company at Rt. 9, Westboro, Mass. 01581.

## ATMs Extended

DALLAS — Docutel Corp. and American Express Co. have jointly announced an automated teller machine (ATM) capability that will enable financial institutions to issue American Express Travelers Cheques, as well as cash, on a 24-hour, seven-day-a-week basis.

The feature uses Docutel's Total Teller 2300 ATM and costs \$150 from the vendor at P.O. Box 222306, Dallas, Texas 75222.

## Micro600 Gets Option

CHATSWORTH, Calif. — Microm Systems, Inc. has announced a Monitor Port Option for the Micro600 port selector, its intelligent terminal-controlled matrix switch.

The option extends the capabilities of the Micro600 by allowing it to be used to monitor data activity while a connection is in progress, using commercially available data monitors such as Spectron Corp.'s Datascope. The option adds "patch and monitor" capability to the Micro600 port selector.

The Micro600 is available in a tabletop enclosure for single minicomputer installations and in a floor-standing cabinet for larger installations supporting several hundred computer port and terminal connections. The tabletop version ranges in price from \$6,000 to \$10,000; prices for the floor-standing model start at \$10,000, Microm said from 9551 Irondale Ave., Chatsworth, Calif. 91311.

## COMPUTER OPERATIONS

### PLANNING EDP EXPANSION? New Site? Modernization of Existing Facilities?

D.P. Facilities Engineers and Designers have 20 plus years of experience to move your facility into the next generation.

- Advance Techniques in Architectural, Engineering and Interior Design.
- Construction Methods & Materials
- Environmental Air-Conditioning
- Uninterruptible Power & Voltage Stabilization
- Fire Detection & Suppression
- Total Security

TIME A FACTOR? Call our D/C expedite group today — for a guaranteed completion date.

(212) 674-8600

## D.P. FACILITIES INC., NATIONAL

Div. F.C.I. Facilities Construction, Inc.

250 Park Ave. South, N.Y. 10003

AVAILABLE NOW FROM FEDERAL . . .

## TELETYPE® MODEL 4540 SYNCHRONOUS DATA TERMINALS



- 3270 software compatible
- Operation in ASCII or EBCDIC
- Clustering capability for up to 32 devices
- Up to 9600 bps
- Whole character, line at a time, impact printing
- Quick installation, easy to use
- Built-in diagnostics
- Modular construction
- Attractive styling

Phone 214/620-0644 today or write:

**FEDERAL Communications Corporation**

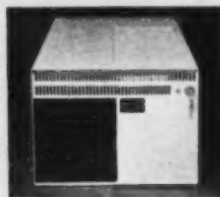
11126 Shady Trail, Suite 101, Dallas, Texas 75229  
214/620-0644 TELEX 732211 TWX 910-860-5529

## HEX-29

The HEX-29 from DIGITAL MICROSYSTEMS is a low cost, high power data processor. Priced like a microcomputer, the HEX-29 is a multitasking, multiuser, time share computer.

The powerful bipolar bit-slice processor includes 16 or 32 bit integer and 64 bit floating point operations, multi-byte/character string processing, translation table instructions and more. HEX-29 will accommodate bit, nibble, byte, word, double word, quad word and variable field operations.

The micro-programmed HEX-29 is a complete system with an expandable complement of powerful software tools. The HEX-29 is a feature-packed minicomputer suited for business or scientific applications.



CONTACT: Ernest Lorenz, DIGITAL MICROSYSTEMS, 4448 Piedmont Avenue, Oakland, CA 94611  
(415) 659-8650

**Digital**   
Microsystems.

## TERMINAL STANDS



Every type of terminal requirement from complete dedicated operator work stations to simple auxiliary stands can be provided by Wright Line. Designed to provide correct keyboard and viewing heights, adequate work surface and filing space, stands are available in a variety of sizes and configurations. For further information, circle the readers' service number or write: Wright Line, Inc., 160 Gold Star Boulevard, Worcester, Massachusetts 01606.

FOR DATA PROCESSING ACCESSORIES AND SUPPLIES, YOUR...  
single source with super service

**Wright** 





# Corporate Directors.

## The DS990 Models 20 and 30. TI's most powerful business systems yet.

If you've been looking for a large minicomputer system for a wide assortment of demanding business data processing loads, look at TI's DS990 Models 20 and 30.

They're equipped with the business software you need — COBOL, Sort/Merge, a Data Base Management System with query and report features, and TI's unique, time-saving screen formatting language, TIFORM. Other

powerful business software languages, like RPG II, BASIC, Pascal and FORTRAN, are also available as well as IBM-compatible communications. And all are enhanced by the proven DX10 Operating System.

The new, high-performance 990/12 CPU provides the throughput you need. In many applications, the Models 20 and 30 can handle 20 or more different jobs at speeds up to three times faster than the

For more information, call:  
1-800-257-7850.  
(In N.J. call 1-800-322-8650)

proven mid-range members of the DS990 computer family. And the compatibility of the DS990 computer family enables you to upgrade your existing hardware and software to the more powerful Models 20 and 30 easily, at minimal expense.

Built into every DS990 computer system is 50 years of experience in the electronics industry, and the technical expertise and support of our world-wide organization of factory-trained sales and service representatives.



Copyright © 1980, Texas Instruments Incorporated

# TEXAS INSTRUMENTS

We put computing within everyone's reach.

## DCP 2050 Models Links

CHERRY HILL, N.J. — Datatel, Inc. has introduced the DCP 2050, a data link simulator that models terrestrial or satellite communications links and inserts delays and introduces errors so users can determine what effects various characteristics will have on their protocols.

Delay and error settings are also independently switch-selectable. The DCP 2050 will inject errors of various lengths.

The unit will test half- and full-duplex protocols and costs \$2,700 for RS-232 interfaces.

An optional CCITT V.35 interface is available for \$500, the vendor said from 2005 Greentree Road, Cherry Hill, N.J. 08003.

## Modem Geared To Private Lines

SUNNYVALE, Calif. — A multispeed modem for use on private-line, short-haul data communications circuits is available from Prentice Corp.

The SLD-MKII modem is four-wire, full-duplex, or two- or four-wire half-duplex in point-to-point or multi-point/poll modes.

Available with switch-selectable data rates from 2,400 bit/sec to 28,800 bit/sec, the modem is said to be a low-cost, direct replacement for Western Electric Co. 201, 208, 209 and 301 modems.

Designed for distances up to 20 miles, the unit costs from \$600 to \$670 for the 9,600 bit/sec model to \$880 to \$950 for the 28,000 bit/sec modem. Prentice is at 266 Caspian Drive, Sunnyvale, Calif. 94086.

## Modem Serves Short-Range Links

WHEELING, Ill. — Gandalf Data, Inc. is offering a synchronous modem for short-range point-to-point communications links.

The LDS 329 will transmit data up to eight miles over dedicated four-wire unloaded lines at switch-selectable speeds of 2,400-, 4,800-

or 9,600 bit/sec. Other features include constant carrier operation, an internal crystal clock and phase lock loop for added stability, the vendor said.

The LDS 329 costs \$450 from the vendor at 1019 S. Noel Ave., Wheeling, Ill. 60090.

## Taper Group Sets Fall Schedule Of Systems, Network Seminars

ATLANTA — The Taper Group, Inc. will conduct a series of seminars on DP and data communications September through December.

A three-day course entitled "Data-comm II" will be held Sept. 17-19 in

Atlanta; Oct. 22-24 in St. Louis; Nov. 19-21 in Charleston, S.C.; and Dec. 10-12 in Pensacola, Fla., at a price of \$350 per student.

"Understanding Data Communications Network Components," which identifies and describes more than 25 network components, will be held Oct. 27-28 in Atlanta for \$375 per attendee. "Understanding the Equipment Acquisition Process" will be held in Atlanta Oct. 29-30 for \$375 per student.

The Taper Group is located at 2433 Hawthorne Drive N.E., Atlanta, Ga. 30345.

# "Stat Mux"

## From The DCC Data Movers

Our STAT MUX can reduce your communications costs by combining multiple costly circuits into one circuit, and improve reliability with error-free transmission. DCC's Data Movers currently service major operating U.S. Networks.

The CM-9100 Statistical Multiplexer offers:

- 4 to 32 subscriber lines
- Synchronous or Asynchronous input protocol
- X.25 Level 2 support
- Built-in diagnostics
- Optional High Speed backup line
- No impact to existing terminals, computers, or software
- Many other standard and optional features



### Immediate Delivery!

For further information contact the Data Communications Marketing Department.



### Digital Communications Corporation

A **ADACOM** Company

11717 Exploration Lane  
Germantown, Maryland 20767  
(301) 428-5600 TWX 710 828-0541

#### Atten: Data Com Marketing

Please send me more information on DCC's Data Movers.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_



11717 Exploration Lane  
Germantown, Maryland 20767



## Fallback Switch For RS-232 Lines

NORWALK, Conn. — A fallback switch that permits push-button switching of RS-232 data lines between communications and/or terminal equipment has been introduced by Datacomm Management Sciences, Inc.

The FS-25 unit switches all 25 signal leads of the RS-232 interface. A passive device, the switch requires no operating power and is transparent to all data rates through 19.2K bit/sec.

The FS-25 costs \$100 from the firm at 181 Main St., Norwalk, Conn. 06851.

## Aydin Offers Error Tester

FORT WASHINGTON, Pa. — Aydin Monitor Systems is offering a bit error rate tester that can generate and compare digital data at rates from 100 bit/sec to 5M bit/sec.

Directed at users of low-speed wire communications or high-speed satellite communications, the Model 852B features signal generation, signal perturbation, signal comparison and data quality readout.

The cost of the Model 852B begins at \$8,500, Aydin said from 502 Office Center Drive, Fort Washington, Pa. 19034.

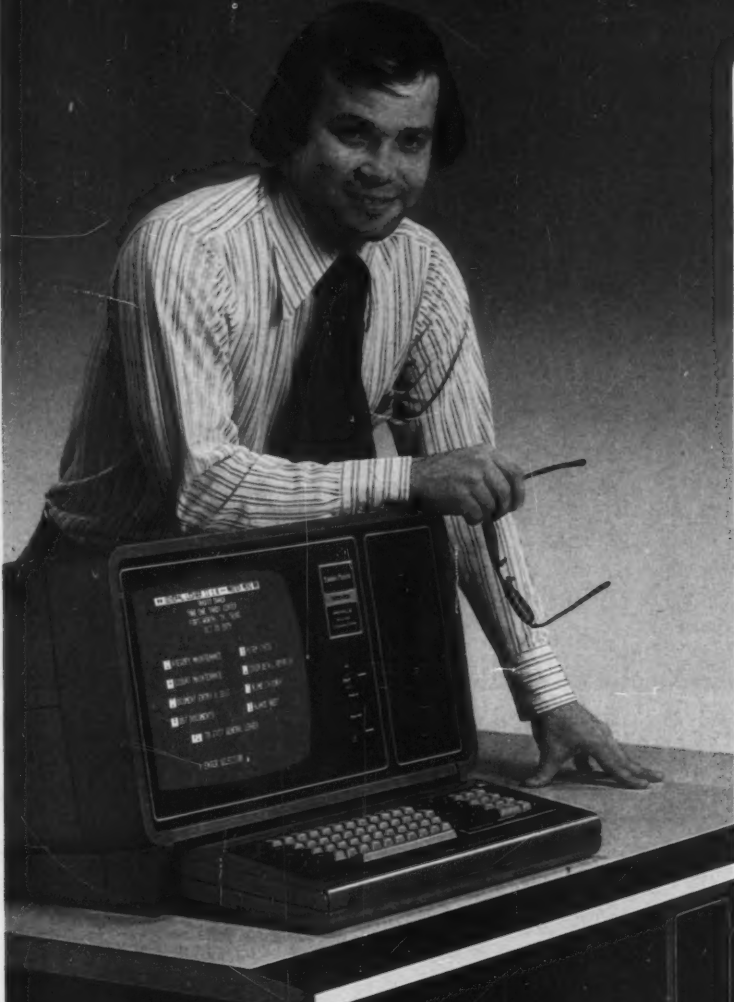
## 3Com Book Lists Local Net Vendors

MENLO PARK, Calif. — A book that lists more than 40 vendors of network components and systems, including transceivers, modems and communications software, has been published by 3Com Corp.

The *Local Computer Network Vendor List* is a compilation of manufacturers that supply products that fit within the loosely defined category of local computer networks.

The book is available for \$125 from 3Com at 3000 Sand Hill Road, Menlo Park, Calif. 94025.

# TRS-80 Model II<sup>TM</sup> Now Speaks Your Language!



WANT TO KNOW MORE? OUR TRS-80 COMPUTER  
CATALOG IS YOURS FOR THE ASKING!

Radio Shack Dept. CMA-81-A-8  
1300 One Tandy Center  
Ft. Worth, TX 76102

**YES!**

Please send me the  
TRS-80 Computer Catalog

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Firm \_\_\_\_\_ Dept. \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone No. \_\_\_\_\_ / \_\_\_\_\_

## COBOL

Exclusive "Minicomputer" Version of ANSI '74  
Multi-Keyed ISAM • Full Level-2 I/O Commands  
Interactive DEBUG with Address Stop, Single Step and  
Variable Display  
Single-Pass Compiler  
CRT Control with Extended ACCEPT/DISPLAY Commands  
Includes Editor, Compiler, Run-Time and Print Packages • \$299\*  
cat. no. 26-4703

## FORTRAN

Extended ANSI '66  
Complete Error Documentation in Compiler  
Hex and Octal Addresses Can Be Specified for Compiler Listing  
Includes Editor, Compiler, Linking Loader and Subroutine Library  
• \$299\* cat. no. 26-4701

## EDITOR/ASSEMBLER

Uses Either 8080 or Z-80 Mnemonics  
Constants Can Be Specified in Octal, Hex Decimal and Even  
Binary  
Includes Editor, Assembler, Linking Loader, Cross Reference and  
FORTRAN Subroutine Library • \$199\* cat. no. 26-4702

## MODEL II BASIC

Disk-Based 17K BASIC Interpreter  
Supports Advanced String Handling  
Complete EDITING Command Structure and Renumbering  
Hex and Octal Conversion • Error Trapping  
Multi-Dimensional Arrays  
No Extra Cost—BASIC and DOS Included

## MODEL II HARDWARE

Z-80A Microprocessor at 4 MHz  
32K or 64K RAM  
Two RS-232C I/O Ports and One Parallel Port  
24 Lines of 80 or 40 (Wide) Characters  
Built-In 8" Dual-Density Floppy Disk (485K)  
Expandable for a System Capacity of 2M  
TRS-80 Model II hasn't become the success it is today by resting  
on its specs. Behind our TRS-80 line is a supporting network  
of over 6000 domestic Radio Shack Computer Centers, Stores  
and Dealers offering:

- Low Prices—the 64K Model II (for effective use with  
these languages) costs just \$3899\*
- Leasing—to make a complete system affordable right  
now
- Service Agreements—from limited carry-in to unlimited  
on-site in many metropolitan areas

**Radio Shack®**  
The biggest name in little computers<sup>TM</sup>

\*Prices may vary at individual stores and dealers.



# DON'T BUY THE HEAVY-WAIT.



If you've been waiting around for 3278's to be delivered, relief is in sight. It's the ITT Courier C278 display terminal. Completely plug-compatible. More functional. Lower priced. And ready right now for fast delivery.

The C278 is designed to maximize operator productivity. With exclusive features and functions like our non-glare, non-smear screen that's brighter, clearer and easier to read. Time-saving reveal mode that displays format attributes on command for faster trouble-shooting. High-speed cursor that's twice as fast as IBM's. And variable field

underline that increases input accuracy.

Another exclusive is our financial flexibility. Terms, leases and some very attractive installment purchase programs.

So for local or remote operation, let our plug-compatible C278 be the bright spot in a dark delivery picture. Call your ITT Courier branch office for our latest technical bulletins. Or contact us at ITT Courier Terminal Systems, Inc., 1515 W. 14th Street, Tempe, AZ 85281.



**ITT** *Courier*

HEADQUARTERS ITT Courier Terminal Systems, Inc. (800) 528-1400.  
Attention: Skid Pirtle.

|                                  |                                 |                                    |                                   |
|----------------------------------|---------------------------------|------------------------------------|-----------------------------------|
| Atlanta, GA<br>(404) 329-9472    | Cleveland, OH<br>(216) 447-0455 | Denver, CO<br>(303) 433-8607       | Kansas City, MO<br>(816) 483-6530 |
| Boston, MA<br>(617) 890-9595     | Columbus, OH<br>(614) 866-9358  | Detroit, MI<br>(313) 358-3090      | Los Angeles, CA<br>North          |
| Charlotte, NC<br>(704) 523-2401  | Dallas, TX<br>(214) 233-9002    | Hartford, CT<br>(203) 633-6724     | (213) 879-1631                    |
| Chicago, IL<br>(312) 920-2770    | Davenport, IA<br>(319) 386-8620 | Houston, TX<br>(713) 780-0309      | Los Angeles, CA<br>South          |
| Cincinnati, OH<br>(513) 563-8050 |                                 | Indianapolis, IN<br>(317) 783-2974 | (213) 594-6581                    |
|                                  |                                 |                                    | Miami, FL<br>(305) 442-2645       |

|                                    |                                    |                                     |                                     |
|------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|
| Milwaukee, WI<br>(414) 782-0776    | N. New Jersey<br>(201) 225-3232    | Phoenix, AZ<br>(602) 267-9191       | St. Louis, MO<br>(314) 434-3199     |
| Minneapolis, MN<br>(612) 937-2067  | Okla. City, OK<br>(405) 949-0077   | Pittsburgh, PA<br>(412) 923-2446    | Toronto, Canada<br>(416) 676-9930   |
| Montreal, Canada<br>(514) 337-4841 | Ottawa, Canada<br>(613) 236-5526   | Rochester, NY<br>(716) 461-5700     | Vancouver, Canada<br>(604) 682-2751 |
| New Orleans, LA<br>(504) 838-8021  | Philadelphia, PA<br>(215) 265-7620 | San Francisco, CA<br>(415) 451-9411 | Washington, D.C.<br>(301) 459-3000  |
| New York, NY<br>(212) 751-0500     |                                    | Seattle, WA<br>(206) 382-9187       |                                     |

# The Programmer/Analyst Is an Endangered Species

By Lawrence H. Cooke Jr. and Joseph P. Campaniello

Rarely do banking organizations innovate in labor productivity. Most of the time, data processing in banks is viewed as less innovative than, say, in universities or in manufacturing.

However, there are profound changes occurring in the data processing function within banking organizations. The transformation is moving so slowly and naturally that most observers are unaware of the fundamental nature of the shift. The key to this phenomenon is the emergence of the customer services representative (CSR).

One might trace the original CSR to the hardware vendor's systems engineer (SE). These individuals represented the vendor in dealings with the customer on a long-term basis, while the salesman concentrated on pure selling. The SE provided continuity with the client and established a detailed level of communication over long periods of time.

Evolving somewhat later were customer service personnel at time-sharing companies. These individuals also served to augment the sales staff but the emphasis shifted to addressing the user's software needs, rather than explaining how to utilize hardware.

The banking model for the CSR moves entirely away from the sales role. As we shall see, the function of user liaison is autonomous. This has positioned the CSR to be a coincidental predator to the species called the systems analyst.

Stated bluntly, the systems analyst job is obsolete and is going the way of the dinosaur. The systems analysis function is shifting to the user. The CSR is the liaison between the technical programmer and the user. These representatives have unique "survival of the fittest" qualities.

To be convinced of the impending extinction of the nontechnical systems analyst, one need only turn to the Help Wanted section of any newspaper or trade publication and seek the following ad (here satirized only slightly):

**Wanted:** "Nontechnical systems analyst; programming experience must be nonexistent or at least 10 years old. Duties consist of misinterpreting users' requirements, introducing delay and policing user areas to make sure programmers do not contact users directly. Salary commensurate with de-

suetude."

An ad like that, if it exists, is buried among thousands of ads seeking programmer analysts. DP shops may even encourage any nontechnical systems analysts they have on board, but nobody is looking very hard for them in the marketplace. The systems analyst pool is drying up slowly, and those in that pool will survive only by adapting to the technical ranks or by becoming users.

To notice evolution, a long view must be taken. In the '50s, programmers were mathematicians who coded in "actual." Cobol was invented in 1959 to eliminate programmers, so that any Jack or Jane in the user area could write programs. Well, that did not happen, except perhaps in accounting. In the '60s, programming became more complex. To deal with that world, applications and systems programmers were differentiated. Programmers raided the user areas and installed technically elegant systems that didn't serve users' needs very well.

In the '70s, DP "came of age." Systems analysts blossomed and systems improved. But in the '70s, computers had improved a millionfold over the prototypical models, and 10,000-fold over the '60s alone. Most systems analysts simply could not keep up. Instead of facilitating DP growth, they began to impede it. As a group, they failed both as users and as programmers. The natural selection process must lead them to follow the "actual" coding mathematician and the user-Cobol writer into the DP museum as interesting but defunct species.

## Moving Into Void

Imperceptibly, the customer services representative is moving into the productivity void left by the retreating systems analyst. Through increased generalization of the CSR, rather than through the narrowing specialization of the systems analyst, we believe (in DP as in the physical environment) that generalization offers better adaptability for survival. This CSR hybrid will grow and flourish in the '80s.

Before we turn to the CSR, let us examine the growing evidence of the end of systems analysis as a career field.

First, there is the marketplace's lack of interest, noted above. Then, there is the unreasonable explanation of superhuman qualities for systems ana-

lysts of which we will name only a few: "organizational skills, conflict resolution, planning and control, design skills, leadership ability, comfort with all organization levels, sensitivity to politics, sympathy with company goals and empathy for technology." A recent study at MIT's Sloan School of Management noted "alarming results" for expectations of chief executives about systems analysts. The study stopped short, however, of the conclusion of obsolescence.

In our opinion, no job category can perform all those functions. There are some isolated individuals who have those skills but these are as rare as "Renaissance men." We are not pro-

posing that an organization fortunate enough to have Leonardo da Vinci on its staff should discharge him; rather, we advocate a realistic appraisal that the systems analyst's job is in fact three jobs — DPer, user and liaison (CSR).

## Case of Adaptation

The appearance of the CSR function in user departments coincided with the systems analysis shift to the user. In order to prevent DP from running rampant throughout user areas, an emissary was appointed to deal with DP personnel as a way of limiting the intrusion into the daily routine. The em-

(Continued on In Depth/2)

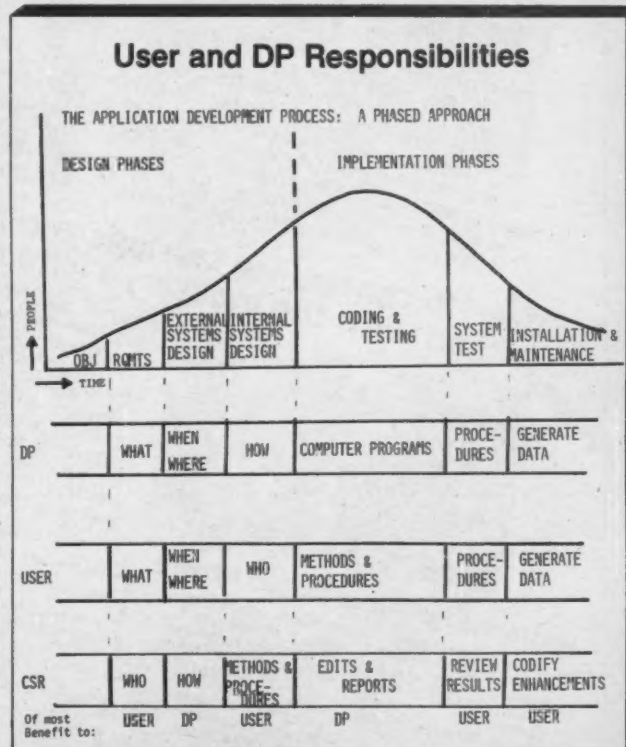


Figure 1. The top part of this chart is the traditional "life cycle" drawing of systems resources over time. The activity in the center of the chart is a view of functional role sharing between DP and the user. The bottom part of the chart shows the authors' view of the CSR liaison.

## IN DEPTH

(Continued from In Depth/1)  
issary became more intertwined with DP activities over the project's life.

This involvement was soon perceived to aid DP as much as or more than the user. DP recruited these individuals to propagate the techniques in different areas where users did not have intimate, detailed knowledge of a particular routine. This was found not to be too great a drawback; these individuals knew how to ask questions and take notes.

Figure 1 illustrates the process. The top curve is the project life cycle. The middle "activity bonds" show user and DP roles across the project. The bottom portion shows the CSR role and who benefits most at each stage.

Over the last few years, enlightened DP shops have learned to "use the user." Also, users provided themselves with defenses against DP excesses. Feasibility studies are a symbol of the former, and formal user sign-offs characterize the latter. These mecha-

nisms evolved independent of the CSR phenomenon we are outlining; nonetheless, CSRs facilitate the process.

The CSR offers a significant comparative advantage over other groups within organizations in three basic areas. In providing a liaison between DP and the user, CSRs provide communication, continuity and credibility.

### Primary Strength

Communications ability is the primary strength of the CSR. The pur-

pose of the function is, first and foremost, to communicate. Rightly or wrongly, DPs are not known for communications prowess. Most of the time, DP activity is viewed from the user side as downright secretive—or worse. CSRs break down some stereotypes through their constant contact with users.

Used effectively, the CSR has a leading role in all DP-user contacts. Commonly, the forum is a meeting. Meetings may take the form of specific project meetings, periodic status meetings or ad hoc meetings to air user concerns. Unlike the systems analyst, who is expected to pontificate for DP on the spot, the CSR usually records questions and issues which are to be reviewed later.

The communications function of the CSR is initiated, not surprisingly, at the beginning of the project. The bottommost "activity bond" of Figure 1 highlights the major focus of activity at each stage of the life cycle. In a properly functioning liaison group, the CSR acts as go-between to get the right people involved. Depending on the strength and seniority of the CSR group, the CSR may be the controlling function (that is, the project manager) or the recording secretary for DP. Below, we will illustrate some organizational options.

### External Design

Formation of the project group having been accomplished, CSRs next aid DP in external system design by transmitting specs to DP in English. The maximum potential of the CSR is realized in this stage. By articulating requirements in business English, CSRs avoid the pitfalls often engendered by systems analysts. Rather than confuse the user with Cobol or pseudocode, English allows an exchange of requirements, free from mystique or jargon.

When the organization has a framework of standards, CSRs can filter a

(Continued on In Depth/4)



# COMMUNICATION NETWORKS

## Conference & Exposition

January 13-15, 1981  
Albert Thomas Convention Center  
Houston, Texas

## 3rd Annual ComNet Draws Top Professionals...

Just three years old, but the show and conference have already won an international audience that's concerned with TOTAL communications... the unified voice and data NETWORK that digital technology will put in place. The top corporate telecommunications executives are drawn to COMMUNICATION NETWORKS because they know the program will address ALL of their technical and managerial needs.



## Over 70 Conference Sessions and an Exhibit Hall packed with the industry's elite manufacturers



Leaders in telecommunications management, technology and applications make up the COMMUNICATION NETWORKS speaker list. You'll meet them at more than seventy planned sessions. Over five dozen leading U.S. and international experts in network technology and management are chairing and putting together informative sessions offering the practicing telecommunications professional the best program in the industry.

Call (800) 225-4260 for latest program information  
MAIL TO: COMNET '81, 375 Cochituate Rd., Framingham, MA 01701

### Here's the Tip of the ComNet Iceberg

NETWORK ARCHITECTURE  
NETWORK POLICY AND MANAGEMENT FOR U.S. AND INTERNATIONAL USERS AND CARRIERS  
NETWORK OPTIMIZATION AND OPERATIONS  
NETWORK SOFTWARE

NETWORK HARDWARE  
NEW DEVELOPMENTS  
SATELLITE DEVELOPMENTS  
INFORMATION APPLICATIONS  
NETWORK ECONOMICS  
OFFICE OF TOMORROW  
SECURITY, EXCryption AND PRIVACY PROBLEMS  
AND MORE!

Register Now

I am interested in information on:  
☐ Conference Registration ☐ Exhibit Space  
 Name \_\_\_\_\_  
 Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City/State/Zip \_\_\_\_\_  
 Telephone \_\_\_\_\_

## POWER PREDICAMENT No. 6

Your computer can't wait even one split second!



Voltage transients, sags, surges, light flickers and other common Power Gremlins lasting just a few hundredths of a second cause computer processing errors and system crashes. Static power systems (without batteries) including transformers, regulators, and power centers lack the ride-through to bridge momentary electrical "glitches," leaving the computer vulnerable to inefficiency and damage.

Only the Atlas UPC/Uninterruptible Power Conditioner guarantees new, perfectly clean, flicker free, computer grade electrical power—and at a very affordable price. Anything less is power pinching!

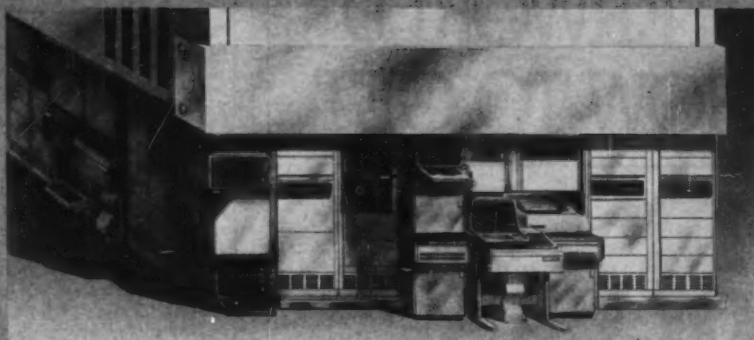
Call or write for Atlas literature.

**ATLAS ENERGY SYSTEMS**

Home Office: 3437 Rush Street, South El Monte, CA 91733  
 Phone (213) 575-0750  
 Regional Centers: Boston (617) 492-7251, Chicago (312) 372-7231



# SPERRY UNIVAC MINICOMPUTERS ARE SUPPORTING IBM.



IBM need no longer hold total control over your distributed data processing (DDP) system.

Now you have a choice.

Sperry Univac V77 minicomputers with our PRONTO operating system tie in your terminals, additional remote minis and IBM host so you can communicate throughout your system with no software modifications. Your remotes can even talk among themselves through as many terminals as you want and remain fully functional when your host is down.

Not only do we offer faster delivery on a better product at a lower price, we make sure your system keeps working after it's installed. That's why we have over 10,000 technicians worldwide, servicing equipment whenever, wherever it needs attention.

Our system takes the risk out of DDP, because it works. Would you expect anything less of a division of the \$4 billion

Sperry Corporation? After all, we were first in the computer business. And we have a reputation to uphold.

We're off-loading Sperry Univac and IBM mainframes in distributed data environments all over the country. Our V77s work well with IBM.

They're totally compatible.

So, if you're considering enhancing your DDP system or building a brand new one, call us at Sperry Univac Mini-Computer Operations, we listen. And while we may not be IBM's sole means of support, we sure are helping them carry their load.

For more information, write to us at Sperry Univac Mini-Computer Operations, 2722 Michelson Drive, Irvine, CA 92713. Or call (714) 833-2400, Marketing Communications.

In Europe, write Headquarters, Mini-Computer Operations, London, Brentfields, Stonebridge Park, NW10 8LS, England.

In Canada, write Headquarters, Mini-Computer Operations, 55 City Centre Drive, Mississauga, Ontario, L5B 1M4.

**SPERRY + UNIVAC**

The computer people who listen.

## IN DEPTH

(Continued from In Depth/1)  
checklist of design actions to DP in a coherent way that is not easily learned by users unfamiliar with DP parameters. Such a checklist could include volume expectations, peak vs. average loads, response time variables that are commercially viable and so forth.

Unlike the systems analyst, the CSR makes no pretense of knowing all the answers to complex technical issues; these come next in internal design and are made by DP. This deferral to the

proper stage avoids the systems analyst's tendency to execute the internal design prematurely, thereby falling either into a technical void or missing the user's real problems. English provides an effective feedback mechanism.

### Preventing 'Freeze'

In internal design, the CSR devotes time to the user while DP constructs the system. The CSR has exclusive contact with the user during this stage.

Without this contact, disaster could occur.

The CSR presence counteracts a classic flaw with the systems analyst's approach; the system may be "frozen" for months and the user's needs may change unnoticed. The CSR presence with the user through the "winter of discontent," while no life seems to emanate from DP, may prevent inflexibility to user changes. This presence permits a penetration to DP for a "thaw" in the frozen specs' should it become

necessary to keep up with the user's business plan.

The CSR leaves a path open to identify which methods and procedures are required to place the DP (system) software in the user's (human) environment. Insofar as the CSR represents DP, at least someone is continuously aware of the user's environment. His prior experience with users in other system installations eases the user through the trauma of computerization.

Coding and testing shift the CSR's view back to DP. The CSR gathers test cases and highlights unusual conditions. He helps DP understand edit requirements and provides a first line of defense for the user against meaningless, unusable and incomprehensible reports. (However, we all recognize some incomprehensible reports will get through to the user notwithstanding—we are not describing perfection, but improvement.)

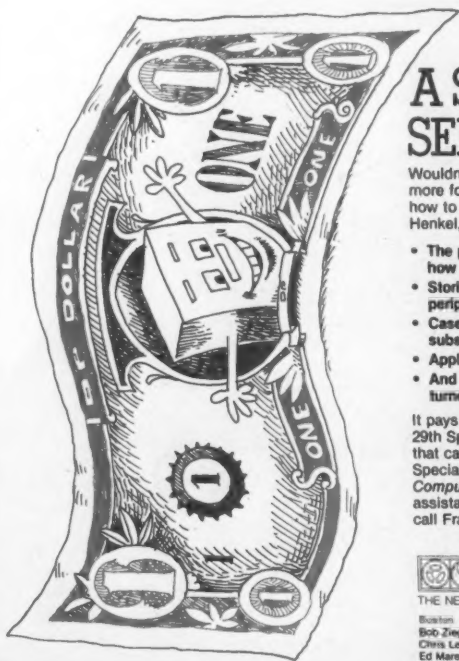
This interaction frees programmers from hunting down users for approvals without the iron wall systems analysts tend to build. Since the CSR's function is that of a facilitator rather than a guru, professional pride is not an issue. CSRs avoid the source of friction between nontechnical systems analysts and programmers in search of the goat: "I specified it right, but you implemented it wrong." If the CSR is not sure what the user wants, exactly, he will ask. After all, that is the job—not to pontificate or interpret the user's needs, but to communicate those needs.

### Later On

Later phases have the CSR linger, when the systems analyst would usually flit away to the next project, leaving the poor programmer holding the bag. CSRs help the user interpret system test results. A new or modified system requires users to behave differently. Change is hard to accept where routine normally prevails. Having a presence in the user area during system installations (probably the same individual who was there in the design process) is very comforting to users cutting teeth on new processes.

Help over the initial rough edges may spell the difference, in user perception, between a success and a failed DP project. CSRs help smooth the rough edges by providing sympathetic on-the-scene feedback to DP which cannot be duplicated elsewhere. They can be more objective than either user or

# LET COMPUTERWORLD SHOW YOU HOW TO GET "MORE DP FOR THE DOLLAR-"



## A SPECIAL REPORT SEPTEMBER 29TH

Wouldn't it be nice to reverse the inflationary trend and get more for less? Well, *Computerworld* is going to show you how to wring more DP from your budget. Edited by Tom Henkel, this Special Report will give you information on:

- The problems in trying to reorganize to save and how they can be overcome.
- Stories about saving money on CPU's as well as peripherals.
- Case histories of users who have saved money by substituting one form of media for another.
- Application stories about hardware and software.
- And other areas such as training, employment and turnover.

It pays to save your DP dollars, so don't miss our September 29th Special Report. And if you market products or services that can help cut DP costs, tell people about them in this Special Supplement. Ad closing date is September 12th. Your *Computerworld* representative can give you complete assistance in ad planning. Or, to reserve space for your ad, call Frank Collins at (617) 879-0700.



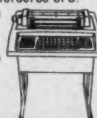
**COMPUTERWORLD**

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

|   |   |   |   |  |
|---|---|---|---|--|
| Boston<br>Bob Ziegel<br>Chris Lee<br>Ed Marecki<br>Kathy Doyle<br>Su San Worthe<br>(617) 879-0700 | Chicago<br>David Dolber<br>Bob Ziegel<br>Jane Wrightman<br>(312) 782-7565 | New York<br>Don Pagan<br>Mike Masters<br>Peter Senti<br>Candy Kelly<br>(201) 967-1350 | San Francisco<br>Bill Healey<br>Barry Milione<br>Bob Stelson<br>Ruth Gordon<br>(415) 421-7330 | Los Angeles<br>Jim Richardson<br>Bob Hubbard<br>Kathy Knox<br>(213) 450-7181 |
|---|---|---|---|--|

### DOUBLE YOUR LA36 DECWRITER'S SPEED TO 60 CPS

The ACCELEWRITER converts the LA36 Decwriter from 10/15/30 to 10/30/60 CPS. Utilizes Decwriter's own built-in 60 CPS speed. Plugs into logic board. Decwriter reconverts to "stock" in seconds. Thousands sold. In use for over 3 years. \$115 includes shipping. Brochure sent promptly at your request.



LARKS ELECTRONICS & DATA  
P.O. Box 22, Skokie, IL 60077  
(312) 677-6880

DP, for they neither invented the system, nor are they shackled with past traditions.

Last, in the installation and maintenance phases, CSRs provide a conduit to DP to explain and possibly rank enhancements. Properly used, they buffer DP from expensive and frivolous requests, yet they allow users to reach DP on sensitive issues.

Communications is the core of the CSR job. CSRs provide no product other than packaging user requirements to DP and unscrambling DP for users. This process may be properly viewed not as overhead but as an efficiency tool.

A paragraph of clear English is worth a box full of Cobol to most users. From the other vantage point, a crisp, ordered checklist to DP is worth a week of aimless rambling about what the old procedures used to be.

Most DP projects that are less than successful are more often the result of "failure to communicate" rather than technical flaws. CSRs help get the messages through both ways.

#### Concern for Continuity

With turnover as rapid as it is today, many DP shops risk total disenfranchisement from their parent organizations. Rapid turnover exacerbates the loyalty shift in DP (never strong) away from the organization at an increasing rate. Programmers generally care little about user concerns; they are technology-oriented.

Tenure in DP areas is dropping even as the industry is leaving its "infancy." (It has been only 35 years since the Eniac was developed as op-

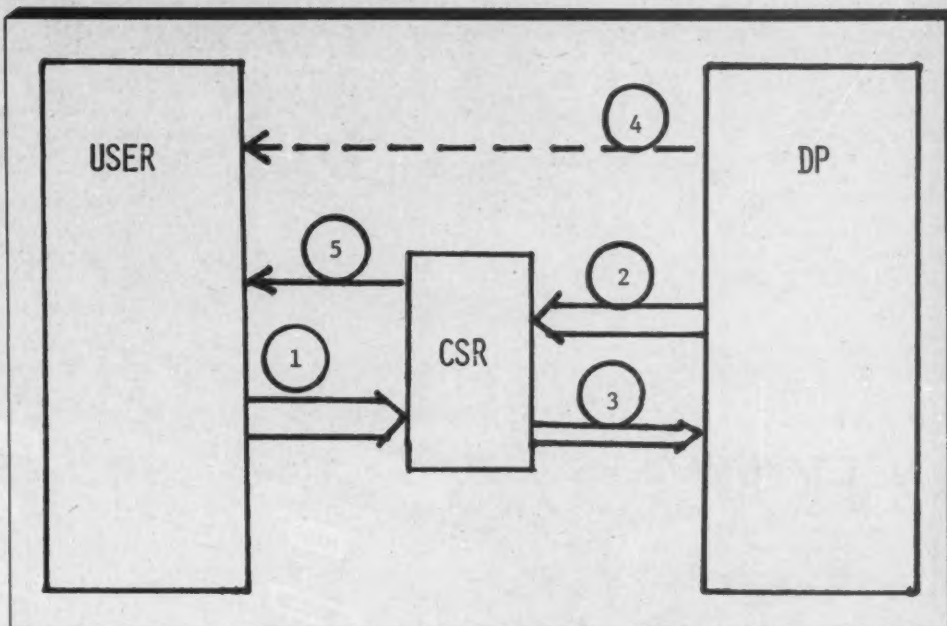


Figure 2. Personnel flows into and from the CSR area. As a general rule, the width of the arrow implies relative magnitudes of the flow.

posed to nearly 400 years since double-entry accounting.) How many DPers in your organization have the 25-year pin? How many have the 25-month pin? DPers proclivity to jump ship for the next technological mirage makes the traditional technical organization a poor reservoir for the

(Continued on In Depth/8)

## COMPUTER DEALERSHIP AVAILABLE



Centurion Series 100

Dealerships are still available in some major cities for the Centurion product line by Centurion Computer Corporation. Success paths of present dealers prove the integrity of the Centurion line.

- Reliable • Unequaled margins
- Complete and totally upward expandable
- Software packages

Complete dealer start-up and on-going support by Centurion assures dealers of sound, profitable posture in the shortest possible time.

- Dealer management guidance
- National and local advertising
- Training-technical, programming & sales

For more information contact:

Lou Weinrich 800-527-4266 214-699-8400  
Centurion Computer Corporation  
1780 Jay Ell Drive Richardson, Texas 75081

**Centurion**

# IMS/VS

**CompEd™ ANNOUNCES DATA BASE TECHNOLOGY COURSES\***

These courses are intended for first-time users of IMS/VS, current users who require continuous training, or current users who are implementing new applications for departments having no experience using IMS/VS.

**Introduction to IMS/VS Concepts and Facilities**  
Sept. 22, 23 1980 9 AM - 5 PM  
Training for initial applications using the Data Base and Data Communications facilities of IMS/VS.

**IMS/VS Applications Programming DB**  
Sept. 24, 25, 26 1980 9 AM - 5 PM  
Training for writing ANSI COBOL programs using the Data Base facilities of IMS/VS.

Both courses help the user to avoid the complexity and hardship usually associated with IMS/VS development and implementation.

**OTHER DATA BASE COURSES AVAILABLE FROM CompEd:**

- Introduction to Data Base Technology
- Advanced Data Base Technology
- MFS On-line Message Formatting for IBM 3270 Information Display System
- Data Base Design in an IMS/VS Environment
- IMS/VS Advanced Data Base Processing

Call COLLECT or write for complete information:

**CompEd™**  
(212) 921-8676  
1133 Ave. of the Americas, New York, N.Y. 10036  
A subsidiary of Spiridellis & Associates, Inc.  
\*Early registration recommended.  
Courses based upon Monday-Friday schedule

**yes,** Please send more information & registration forms.

Name \_\_\_\_\_  
Co. Name \_\_\_\_\_  
Address \_\_\_\_\_ State \_\_\_\_\_  
City \_\_\_\_\_ Zip \_\_\_\_\_





## Four-Phase gives you the widest choice of network planning tools.

## All backed by IBM-compatible network experience.

### The one system that does the work of several.

Typically, any good sized organization needs multiple displays at outlying locations to do data entry, local and remote inquiry, word processing and a small amount of COBOL local processing. The powerful MFE/IV™ Multifunction Executive system from Four-Phase lets you combine all these functions with IBM-compatible batch and interactive communications. All on one system. All at once.

MFE/IV protects your investment by adding capacity without adding to central system overhead. You can choose just the right combination of hardware and ready-to-run software you need at each user site, and link them to your chosen central mainframe location. With MFE/IV you can build a unified system network—sharing data, resources and processing between your central mainframe and your remote user locations.

Field-proven, MFE/IV systems install easily in hours, and that means a substantial savings in development time alone.

### Hundreds of networks up and running.

For more than ten years, Four-Phase has been successfully installing distributed processing in IBM-compatible networks. We support the current line disciplines and terminal characteristics, and we have an ongoing commitment to support new communications technologies.

Our headquarters trained systems engineers are available at local offices nationwide for network planning, installation, customer education and continuing software support.

### Ask for a demonstration.

Let us show you how to get The Multifunction Edge. For a personal demonstration, return the coupon below or call your nearby Four-Phase Systems office. Also available through Four-Phase Systems, Ltd. in Canada and distributors throughout the world.

Yes, tell me more about The Multifunction Edge.

- ☐ Please arrange a demonstration.  
☐ Please send information.

My present mainframe and terminals are \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

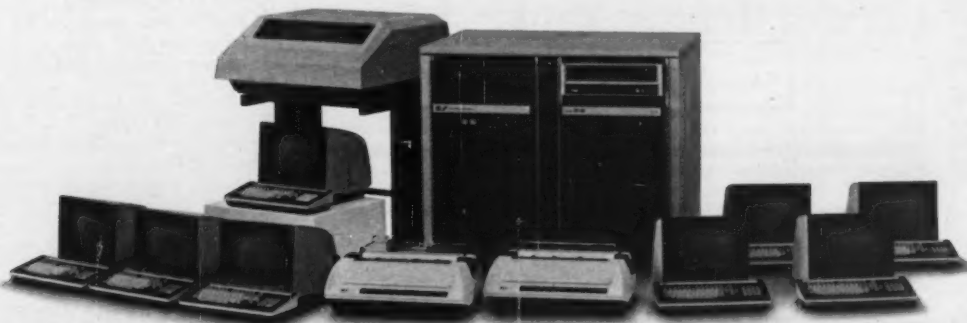
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_

Four-Phase Systems, Inc. MS 42-1B8-M  
10700 N. De Anza Blvd., Cupertino, CA 95014  
Telephone 408/255-0900

CW 9/8/80

MFE/IV is a trademark of Four-Phase Systems, Inc.



 **Four-Phase Systems**  
The Distributed Processing Company

## IN DEPTH

(Continued from In Depth/5)  
company's long-term strategies.

On the other hand, the CSR organization has far lower turnover, retains company loyalty and identifies with the company rather than with technology. Most CSRs couldn't care a fig if a report is accessed via Vsam or Tcam or what. They certainly would not cross the street to join another company because it was using the latest buzzwords. They care about content of reports, about timeliness and about the good old virtues users know and love.

If a user starts a dialogue with a CSR at the beginning of a project, there is a very high probability the same CSR will be with the company at the end of the project and available for consultations even years later. Contrast this possibility with the more standard view from the user's perspective: "Hi, I'm your fourth systems analyst. What are you guys doing on this project, anyway?" That is more typical of the high-turnover situations. The user's frustration with the constant restarts got ground zero in the high-technology approach earns DP the black eye it generally receives in those cases.

CSRs move too, but at a pace most organizations can control and live with. Basic company orientation, loyalty to the firm and product association with the user rather than to technology combine to provide continuity sufficiently long to complete projects.

### More Credibility

It is easy to see how the long-term, ongoing relationship the CSR offers increases DP credibility with the user. Arrogance of the super-tech and flightiness of a succession of company know-nothings are both avoided. Technological solutions that miss the user's needs are not as likely. The CSR's ongoing presence allows for controlled changes rather than for freezing specifications for eons.

Last, company orientation permits a comradeship few DP technical staff members ever form with users. There are far more "us" sentiments to share and fewer "them" attitudes to overcome. Common goals build bridges which increase rapport and enhance DP credibility in the process.

We have tried to show that the CSR development process involves more than taking selected users and dressing them in DP uniforms. CSRs, in the main, come from the user community. However, the role of liaison is substantively different from either DP or the user structure from which most, but not all, CSRs come.

### Making a Start

Any organizational entity must start somewhere. Figure 2 illustrates some possibilities of staff transfer among the user, DP and CSR groups. Clearly, to start the process, the initial transfer must be from the outer areas toward the center. Initially, the main flow is from the user to the CSR group. However, infusion of DP methodology in the CSR area is also helpful to form a

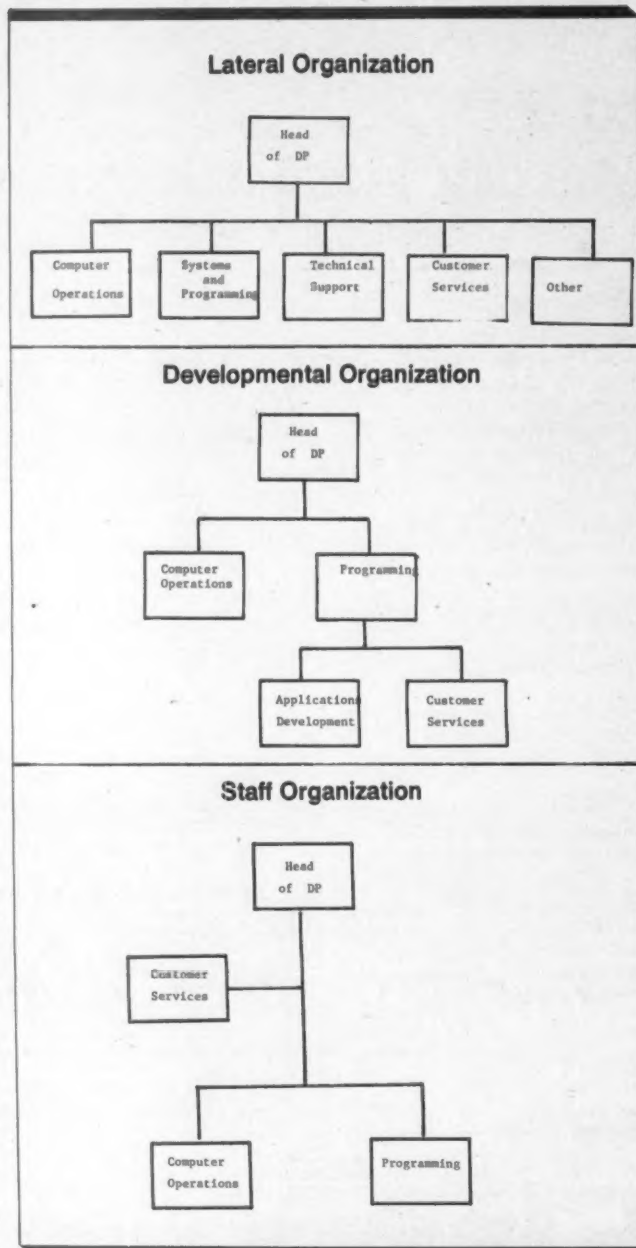


Figure 3. Organizational choices for positioning the Customer Services Group within DP. These three are not the only choices; they are merely suggestive of options available. Of these, (A) offers the most visibility within the DP organization and would probably engender the best user relations.

nucleus CSR group.

Once the organization is in place, controlled rotation of personnel is both possible and highly desirable. We know of situations where CSR personnel have become heads of DP and of major user areas. The process of flow from DP to user areas (which Bill Synnott, head of Management Information Services (MIS) for the First National Bank of Boston, calls placing "Trojan Horses" into centers of the organizational structure) is greatly

enhanced by the way station of CSR training.

It links DP discipline with user concerns and sympathies. CSR training and development offers an ideal pond in which to incubate user-DP rapport.

Perhaps the most difficult task is to position the CSR relative to the user and DP. The authors have found that the best reporting relationship is equivalent to the DP technical staff, i.e., programmers and programmer/analysts. Since the orientation is toward

the company rather than toward the industry, the influence of supply and demand factors is not as noticeable on CSRs as it is on programmers.

In pay structure, the salaries of junior, experienced and senior programmers should be equivalent to those of CSRs with the same amount of experience. In our opinion, as the CSR function becomes better known, understood and sought after, salary levels will adjust. Today, the CSR function (along with systems assurance, technical writing and others) is not yet classified by nationwide salary surveys. However, this lack of clear fit of the CSR function into the organization will be corrected over time as understanding increases.

Figure 3 offers some alternatives showing how the CSR organization might be structured within DP.

The CSR function offers a way to build user-DP relationships. This process offers fresh insights into methods for closing the communications gap, both with users and within the DP organization itself, relative to the obsolescence of systems analysis.

Most organizations need look no further than within themselves. There exists a largely untapped source of talent to help stem the flow of turnover within DP. If programmers are buffered from unnecessary and unproductive user contact, programmer turnover also declines.

We do not pretend that all the problems of technical change will be solved overnight through this organizational move. We do feel, though, that the emergence of the CSR is the most promising development to come along in years.

Lawrence H. Cooke Jr. is senior vice-president and product development manager at BayBanks Data Services, Inc., Waltham, Mass.

Cooke has 17 years' experience in data processing. He joined BayBanks in 1979 after five years as manager of systems and programming at Midlantic Bank in New Jersey. He has also held positions with IBM, Computer Applications, Inc. and the Federal Reserve Bank of New York.

Cooke holds the Certificate in Data Processing and earned a B.A. from Boston University and an M.B.A. from New York University.

Joseph P. Campaniello is vice-president for customer services at BayBanks Data Services, Inc. He has nearly 20 years' experience in banking operations at BayBanks and, before that, at Worcester County National Bank, Worcester, Mass.

For more than 10 years, Campaniello has championed the cause of customer services within the data processing function and at BayBanks customer services has achieved an equal partnership with programmer/analysts.

Campaniello is a graduate of Clark University and has received executive postgraduate training at MIT's Sloan School of Management.



# Attacking Maintenance Costs

By Larry M. Singer

**M**ore than half the programming budget in many data processing installations is devoted to "maintenance programming" — that nebulous, hard-to-define activity known as "keeping the system running." One frequently quoted estimate is that by the mid-1980s, this system maintenance function will require 60% to 80% of the available programming talent. Even now it is not unusual for the maintenance of some business application systems to cost a company more in one year than it cost the company to develop the application systems in the first place.

The DP manager may feel helpless in controlling system maintenance costs. After all, isn't the maintenance burden intrinsic to data processing? Even if an application system requires continual, expensive maintenance, isn't it better just to accept reality and pay the price until the system can be rewritten?

The answer is an unqualified "no." Systems and programming maintenance costs can be reduced by a manager who is willing to take a long, hard look at his entire organization and perhaps challenge some traditional DP procedures. A project to reduce system maintenance costs will involve careful planning, thorough research and forceful implementation. In fact, some reorganization of the DP department may be necessary to fully accomplish such a goal.

An additional benefit of reducing system maintenance costs (besides improving the bottom-line P&L) is that the DP manager will probably improve the morale and productivity of his entire programming section. Most programmers and analysts would prefer to work on development projects rather than maintenance, and most DP managers would rather use their programming resources to help satisfy the ever-increasing demands from user groups.

Moreover, shops which have a high

maintenance effort tend to have high rates of costly personnel turnover.

It is essential that the DP manager prepare his professional staff before any planning or research on a project to reduce system and programming maintenance begins. Obviously, the systems and programming staff will be intimately involved in such a project, and its extra efforts will be a determining factor in the success or failure of the project.

Management should stress that any additional demands placed on programmers — such as extra paperwork — will be justified in the end by reducing the maintenance load.

A program to reduce system maintenance costs usually has three separate but overlapping stages:

- (1) Measuring the existing maintenance effort.
- (2) Summarizing and analyzing the maintenance activity.
- (3) Resolving the maintenance problems on a prioritized basis.

Note that such a project is similar to the classical systems analysis procedure by which the DP profession attempts to help various user groups. In this case, however, DPs will be attempting to help themselves and their company by applying the scientific method to help increase their own productivity. This experience should be very educational for all DP professionals who are engaged in systems analysis and design type work.

## Measure the Maintenance Effort

The first step in any measurement process is to define the activity to be measured. System maintenance, however, is one of those required activities everyone is sure they dislike, but not exactly sure what it is.

For example, a given task may be classified as "development" when interviewing a prospective analyst but defined as "maintenance" when asking the controller for a larger DP budget. The guiding question should be: Is

this task necessary to keep the application system running in a sound, professional manner?

If the answer is "yes," that task or activity is indeed part of the maintenance effort and is not correctly defined as "development" or "enhancement." Such typical programmer and analyst actions as answering questions

and because the existing categories are so vague that they can cover literally everything. If the categories are not properly defined and do not match a shop's typical activities, the programmers may spend more time trying to accurately categorize an activity than the task took in the first place.

Since programmers are more inter-

---

*Most programmers and analysts would prefer to work on development projects rather than maintenance, and most DP managers would rather use their programming resources to satisfy ever-increasing demands from users.*

---

from users, rearranging data on a report, adding badly needed transactions to an update program and making logic fixes are all examples of system maintenance.

Because of the high degree of judgment sometimes involved in separating maintenance from development, the DP manager himself may elect to categorize each activity, or he may appoint one senior-level professional to be the final judge. It is very important that the standards used be consistently and fairly applied in each case.

A time- and project-accounting system is the ideal method to collect the basic data on system maintenance. However, the average time-accounting system (either in-house or purchased as a software package) may have serious deficiencies, either in the way it is structured or in the way it is implemented.

Home-grown time-accounting systems are often of marginal value because they do not have enough catego-

ries and because the existing categories are so vague that they can cover literally everything. If the categories are not properly defined and do not match a shop's typical activities, the programmers may spend more time trying to accurately categorize an activity than the task took in the first place.

Some of the typical but sometimes overlooked "maintenance" actions include:

- Answering phone calls and having personal meetings with users.
- Helping the operating staff with production questions.
- Doing the paperwork necessary to keep the system running.
- Tracking down errors in reports.
- Correcting errors and rewriting application system documentation.
- Performing reruns and restarts of production jobs, including after-hours.
- Following up on production problems.
- Running special jobs that are under programmer control.

If the time-accounting system does  
(Continued on In Depth/12)

# MAGNUSON'S ALL THE 4331 AND MORE,

Some computer manufacturers handle competition by meeting it head-on. Magnuson Computer Systems simply surpasses it.

Magnuson's M80/31 system matches the IBM 4331 Group 2's features, then adds features typically found only on much more powerful and expensive computers. The result: more value when it comes to price and more capability when it comes to performance.

---

## ALL THE FEATURES

---

IBM's 4331-2 has an impressive list of features for any system in its performance class. Compatibility with the 4331. Field upgradeability from the 4331. A minimum of 1 million bytes of main storage. Up to 256K bytes of control storage. A list of microcode assists that includes 370 mode and VSE/ECPS. And operating system support that includes DOS, DOS/VS, and DOS/VSE (370 and native mode). That's where the 4331 Group 2 stops. But it's where the M80/31 begins.

---

## AND MORE

---

### More Price/Performance

The M80/31 doesn't merely outperform the Group 2, it beats it by at least 15 per cent. The Group 2 gets a 19.6 on International Data Corporation's relative performance index. The M80/31 rates a 23.

But the M80/31 wins on more than just performance. It received a 170.4 performance/price rating, compared with the 4331 Group 2's 122.5.

### More Upgradeability

Your M80/31 will never become obsolete. If your application outgrows your Magnuson system, you simply upgrade it. And you do it with a simple board swap in your computer room, because all M80s are field upgradeable. What kind of upgrade is available when your 4331 Group 2 runs out of steam?

### More Expandability

And where do you go when your 4331 Group 2 runs out of capacity? With an M80/31, you can go right up to 8 million bytes of main memory. That's twice the capacity of the Group 2.

### More Software Support

Our M80/31 supports more operating systems than the 4331 Group 2 does. The M80/31 fully supports MVS—the Group 2 doesn't—and the M80/31 supports all the operating systems you'll find on the 4331 Group 2: VS1, VM370, DOS, DOS/VS, and DOS/VSE.

### More Channels

The M80/31 provides a lot more channel capacity: one byte channel and five additional channels—two standard and three optional—that can be configured in any mix of byte, block and selector channels. The Group 2 gives you just four channels—all optional.

### More Throughput

High channel speed means high throughput. All those standard M80/31 channels run at 2.5M bytes/second. The best a 4331 Group 2 can do is 1.85M bytes/second, and that's only on an optional block channel. The rest run at half the M80/31's speed.

### More Control Storage

When it makes sense to put your frequently used instructions in microcode to speed execution, the M80/31's large control storage can help. It offers from 48K to 256K bytes of high speed control storage. The 4331 Group 2 stops at 48K.

### More Cache Memory

If you want the option to use cache to speed up program execution, you want a lot of it. The M80/31 gives you 16K bytes to work with. The 4331 Group 2 gives you 8K bytes.

# EXPERIENCE THE MAGNUSON

# NEW M80/31: -2 FEATURES FOR LESS



Less to keep because you'll avoid the huge investment of replacing your existing system with a new one. That's because with the M80/31, you simply expand and upgrade the same system—on-site—when you need more capacity.

Less to operate because our compact version takes about half the floor space of a 4331 Group 2.

## Less Waiting

You can have your M80/31 on your receiving dock just 30 days after you order it. So your application can run next month.

## MORE FOR LESS

If you're evaluating a 4331 Group 2, you have all these additional reasons for evaluating a Magnuson M80/31. They add up to more capability for less money.

We'd like to help you do it. Just fill in the coupon below and we'll send you more information about the M80/31 in the return mail.



MAGNUSON  
COMPUTER  
SYSTEMS

## FOR LESS

### Less Cost

The M80/31 is economical on at least three counts: it costs less to buy, less to keep, and less to operate.

Less to buy because our Strategic Architecture lets us get performance through smart design, not unproven technology. So we can offer a 1 million-byte M80/31 system with a console, a byte channel, and two block channels for \$135,000 or \$4,500 a month under a two-year lease. A similar 4331 Group 2 costs \$166,000 or \$5,000 a month.

## DIFFERENCE

Magnuson Computer Systems, Inc.  
2902 Orchard Park Way  
San Jose, California 95134

- ☐ I'm interested! Send me more information on your M80/31.
- ☐ I'm really interested! Send me more information on the entire M80 line.
- ☐ I'm interested and in a hurry! Have a sales representative call.

Name

Title

Company

Address

City

State  Zip

CW 8/8



## IN DEPTH

(Continued from In Depth/9)  
not include these activities as "maintenance," it needs to be examined and upgraded before it can be used in any serious study of DP maintenance activity.

### Still Problems

Even with a well-designed, comprehensive time- and project-accounting system, the DP manager may find problems. In the average DP environment, the time-accounting system is

the last production job done during a cycle, and the reports usually sit on a desk until someone bothers to file them away.

Members of the professional staff soon discover the lack of importance of time accounting and become careless in monitoring their time.

Not only should time-accounting jobs be treated as production, but the professional staff should be made aware of the new purpose behind the time-accounting system: that data is

not being collected to be ignored, but to be used as part of a serious, ongoing study.

### Personal Logs

As a by-product of any good time-accounting system, the participants will be forced to log specific events so they can accurately record their time for the week. These "personal logs" will be just as important as the actual time-accounting summary reports, since any qualitative analysis of the

maintenance effort must focus on the specific activities that caused the effort.

Discovering that a programmer spent 70% of his time on maintenance is one thing, but knowing *what* that 70% consisted of is just as valuable.

The DP manager should insist that his staff utilize a daily personal log to record activities and events. While the format of the log should be standardized (with name, time and activity), the actual contents should be left up to the individual, as long as the log is readable and accurate. This log approach should be implemented along with the time-accounting system.

Again, it is vital that management give the staff some feedback from the logs and the accounting reports, even if it is a simple "I can't read this line." Without feedback, the professional staff will never realize the importance of the study and the entire data collection process.

At this point, DP management may encounter overt resistance from the professional staff, especially as it relates to the extra paperwork and the perception that the study has been triggered by a feeling "that some people aren't doing their jobs." The extra paperwork is indeed a burden on a busy staff, but management should point out that the results of the study will be valuable and worthwhile.

The uneasy feeling caused by any study of professional activity can be alleviated by stressing that maintenance is a widespread problem in most DP shops and that a study of maintenance effort is literally a state-of-the-art project.

An interesting sidelight to the use of personal logs is that management may now be able to estimate the hardware

### Introducing the New RAYNET/II:

## THIS COULD BE YOUR BRIDGE TO SNA.

RAYNET/II data communications systems from Raytheon Data Systems will provide your existing 3270-type bisynch network with increased functionality and performance, and still protect your present investment in terminals for the future.

Your existing terminals become more universal because users can access multiple host mainframes—or multiple applications within a single mainframe—from the same device. RAYNET/II processors eliminate the need for redundant, co-located terminals and duplicate networks.

Monthly line costs are lowered by the remote line concentration capability in RAYNET/II systems. Lowering communications overhead on host mainframes is another of the ways RAYNET/II processors can improve your network. The network is decoupled from the hosts, and communications functions are handled directly.

When you are ready for SNA, your RAYNET/II processor will remain totally compatible, and totally productive.

For more information on RAYNET/II or other RAYNET family members, call the RAYNET marketing director at (800) 225-9874. In Massachusetts, call (617) 339-5731.

**RAYTHEON**

### RAYTHEON DATA SYSTEMS

Intelligent Terminals  
Distributed Processing Systems  
Word Processing Systems/Minicomputers  
Telecommunications Systems

Mini/Comm Division  
360 Forbes Boulevard  
Mansfield, Massachusetts 02048

WHEN YOU NEED  
**DEC...**

### TERMINALS

- VT-100 • VT-103
- LA34 • LA120
- LA180

### PDP 11/03 PDP 11/23 SYSTEMS

### LSI/11 MODULES

Demand...Delivery  
Demand...Discounts  
Demand...UNITRONIX

**UNITRONIX**  
CORPORATION

(201) 874-8500

198 Route 206  
Somerville, NJ 08876  
TELEX 833184

resources being used in the maintenance effort. Despite what many programmers think, computer time is not free, and some DP managers will be surprised to learn how many resources they have tied up in "maintenance."

#### Analyze the Maintenance

Once the data collection and personal log procedures are in place, DP management may be tempted to start attacking the apparent causes of the high maintenance effort. This impulse is usually premature, since the true causes of a high maintenance effort may not show up immediately. Rather, long-term study and analysis may be necessary to discover important patterns and trends.

For example, an input error caused by lack of editing in an accounts payable program may cause a high maintenance effort one week, but may actually be a rare incident that happens once every few years. By throwing his limited resources on that one problem, the DP manager may be missing the more expensive and common maintenance problems.

During the data collection process, DP management should have contact with the rank-and-file programming and system staff to explain and encourage the system collection project. But the communication should be both ways — production-minded programmers can provide a wealth of information that will be useful during the summarizing and analysis phase of the project.

For example, if programmer John Jones asks if his unofficial job of helping balance the payroll register every few weeks is a "maintenance task," the DP manager should carefully note such comments. They will help him get a feel for questions that will certainly arise during the analysis phase.

Any study of maintenance effort should also cover those staff members who are not normally thought of as part of the maintenance team, such as first-line managers and systems analysts. If any part of their time is spent in supporting production, their log sheets should be included in the time-accounting and data collection process.

#### Looking Over the Data

The summarization and analysis phase of the project can begin with two months of raw data. This phase is designed to summarize the quantitative aspects of maintenance (the time-accounting reports) and the qualitative portion (the personal logs).

A summary of time-accounting reports may show that the maintenance effort is cyclical. That is, certain times such as month-end or quarter-end require a higher degree of maintenance hours. This information is valuable in planning development projects where certain staff members have dual development and maintenance responsibilities. In those shops with permanent teams of maintenance programmers, the cyclical trends may show that during certain periods some manpower is actually wasted.

Management should use the quantitative data to determine the correlation, if any, between high maintenance activity and turnover. If the shop does indeed have such a correlation, management can predict which individuals are likely to leave and take preventive measures, such as salary adjustments and rotation of assignments.

The qualitative information contained in the personal logs should be summarized by an experienced project leader or senior programmer who is fa-

miliar with both the application systems and shop procedures. This summarization needs to have a minimum amount of interpretation and a maximum amount of pattern analysis. In other words, the summarization should show trends that reveal patterns of maintenance activity consistent over the long term.

This pattern analysis might be arranged by application system, such as an accounts receivable system that needs continual updates to the aging

calculations or an inventory system that requires continual programmer intervention to handle specific requests from user groups. Perhaps the summary will be arranged by operational problems, such as incomplete restart instructions that require programmers to become involved in restarts and reruns.

The trend analysis should be performed independently by several individuals, each taking a one- or two-

(Continued on In Depth/14)



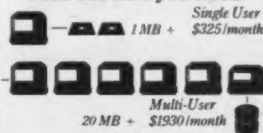
## Watch productivity soar as four office functions are integrated in one system

**This is the only system which handles all the basic business media — data, words, messages, and telephone communications.**

By combining all the basic business media, Datapoint's Integrated Electronic Office gives you increased productivity, improved cost efficiency, and tighter management control.

Here are five more benefits.

#### Pick the size you need.



3-year lease prices shown do not include printers (many types available), maintenance, installation or training charges.

**1. It's the multifunction system you can't outgrow.** You can add workstations, increase processing power, expand peripherals, broaden the common database—virtually without limit. All because of Datapoint's exclusive ARC™ system architecture.

No matter how large the system, responsive performance is provided at every Datapoint workstation.

**2. It gives you word processing with new search power.** Save valuable WP time with Datapoint's exclusive retrieval system, AIM (Associative Index Method). It searches for facts and documents by content. You needn't enter titles or index numbers, just words or phrases from the document you wish to retrieve.

**3. It cuts long-distance telephone bills up to 40 percent.** Datapoint's Long Distance Control System reduces long-distance costs by a combination of least-cost routing for all calls, queuing, and call buffering. It even prints out traffic data to give you greater control of costs. And it works with existing PBX or CENTREX exchanges.

**4. It sends messages in a flash — essentially for free.** Documents can be stored, retrieved, and transmitted automatically from one Datapoint processor to another — across the hall or across the country. By using the excess capacity of your flat-rate voice communications lines

during nonpeak hours, the Datapoint Electronic Message System gives your interoffice correspondence a free ride. With EMS you can even download file updates and programs to all your remote Datapoint processors.

**5. It gives you a unified approach to office integration.** With Datapoint's Integrated Electronic Office, anything goes. Enter data. Compute and store. Retrieve and incorporate in text. Transmit messages interleaved with voice. Receive confirmations of messages automatically. And more.

Let us help you apply the power of the Integrated Electronic Office to your organization now. Call (512) 699-7151 for the number of the nearest Datapoint office. Or write: Datapoint, Corporate Communications, CW-K05, 9725 Datapoint Drive, San Antonio, TX 78284.

**D**  
**DATAPoint**

## IN DEPTH

(Continued from In Depth/13)  
week period and summarizing the results. Naturally, some analysis of the causes of maintenance effort will be integrated within the summarization — this is unavoidable. However, the final analysis will be performed by management using the separate summaries provided by the senior staff. Allowing different individuals to contribute to the maintenance summarization will assure that no major aspects of maintenance will be missed during the final

analysis, which will cover four to six months of data.

Both the senior staff and management should note that maintenance can always be divided into "unavoidable maintenance" and "avoidable maintenance." Updating state tax tables in a payroll system is required by law, but the process by which that updating takes place can be analyzed for efficiency — there is a significant difference between a procedure that takes 10 minutes and a payroll update procedure

that requires several hours of professional time. Any analysis of the time-accounting and personal logs must carefully note this distinction.

### Reducing System Maintenance

After several months of data collection and analysis, management should feel confident that it now has enough facts to begin attacking the true causes of costly system maintenance on a priority basis. The priority list should be determined not only by which problem

leads to the most expensive system maintenance effort, but also by factors such as degree of problem (an incorrect payroll run may be a political disaster for data processing), associated morale problems (a programmer called in to fix the same error week after week may be the next programmer to leave) and availability of resources.

This last factor may be the single most important factor in developing any priority list. For example, if the general ledger system is the single most expensive system from a maintenance view but if the general ledger experts are busy on another project, the maintenance problem will simply have to wait.

There are a number of common system maintenance problems that can affect almost any business DP installation to a degree, but the specific causes of high maintenance are still usually unique to any particular shop.

One expensive area of unnecessary programmer maintenance is in the general category of operational support, usually with reruns, restarts and requests from Operations for help with specific difficulties. Obviously, any application system can and will abend because of bad tapes, disk failures, software errors and operator mistakes, but each jobstream should be documented enough so that members of the Operations staff can handle all common problems themselves. Not only does programmer involvement in the computer room take valuable programmer hours; it can also be a major source of friction between the programming and operations sections.

Adding restart and rerun documentation to production jobstreams involves substantial resources, but the payback period may take less than a year. Also, such a task can offer an excellent training tool for new programmers or for experienced programmer/analysts who are learning these systems and shop procedures.

Too often, however, operational documentation is useless because there is simply too much. For example, Operations "run sheets" typically contain detailed data set or file information, but not specific, cookbook-style restart instructions that can be followed quickly by an operator or shift supervisor.

Before any major documentation project is undertaken as part of a plan to reduce system maintenance, management should carefully reevaluate the current type and style of document-

## FOR PEACE OF MIND AFTER PURCHASE

The industry standard, smart DM terminals from

### Beehive



### FEATURES

**DM30** Multi page operation, 16 loadable function keys (optional), auxiliary parallel I/O, extensive formatting and editing capability.

**DM20** Editing, buffered transmission, extended formatting capabilities, block and character transmission, buffered auxiliary port, extended function keys.

**DM10** Status line, baud rates up to 19,200, addressable cursor, 14 key numeric pad, line drawing capability, self test, time-of-day clock, read terminal status, line lock.

**DM1A** Function keys, memory lock facility, split screen operation, half intensity, independent auxiliary I/O port, single key cursor control, visual attribute control.

**DM 'S' SERIES** Designed primarily for the OEM  
The customizable DM 'S' series terminal is predicated upon Beehive's proven standard DM Series. They are designed for applications by OEM and system houses requiring special protocol features and unique value-added applications.

**AVAILABLE WORLDWIDE**  
from quality distributors

Call for location nearest you . . .

TOLL FREE USA **(800) 453-9454**



## BEEHIVE INTERNATIONAL

"A proven competitive manufacturer of smart terminals"

**VOLUME DATA ENTRY SERVICES**

**KD HOTLINE**  
for INSTANT QUOTES

(800) 228-9410

TWX 9106220199

**AMERICAN KEYDATA**

Mid America Plaza, Suite 144  
7171 Mercy Rd., Omaha, Ne. 68106



tation. Good, simplified operational documentation can significantly reduce programming involvement in day-to-day operational problems.

#### User Support

A second area of usually unnecessary programmer and analyst maintenance effort is in the area of user support. Answering questions regarding reports, data entry, transactions and system usage are all part of a maintenance burden that should be examined.

It may be impossible or politically inadvisable to discourage users from asking questions about application systems, but the DP manager can reduce this burden by verifying that each production system has clear, easy-to-use documentation that explains the system from the user viewpoint. It may be necessary to ask another area of the company for assistance in reviewing written documentation for clarity, such as the sales or advertising division.

Another solution might be to select one professional or paraprofessional to serve as a single production liaison point and free other staff from continual interruptions. It may not be evident from a time-accounting report, but a day interrupted by seven phone calls from various users is a day that has been severely disrupted if the programmer was deeply involved in a task requiring concentrated mental effort.

A third area of programmer activity that affects almost all DP installations is the difficulty in making changes to existing application systems. While adding a new report or new transaction code to a system may be thought of as "development," in many cases such a "development" task turns out to be a maintenance nightmare. Not only is it a difficult, time-consuming project, but errors usually result from these new features that require extensive maintenance effort.

Such "simple" changes can cause severe problems because DP manage-

ment does not control the efficiency of system maintenance changes. In fact, most DP shops perform maintenance changes in an archaic, inefficient manner that would not be tolerated in any other division of the company.

The entire change process can be simplified and made more reliable by realizing that changes to any application system are rarely unique. For example, during the seven-year life of a payroll system, there may be 15 requests to add new data fields to the

payroll master file. Yet in each maintenance (or "development") project, the analyst or programmer usually has to reinvent the wheel by first determining how to accomplish the required change.

The answer is usually a list of 10 or 20 or 30 specific steps written on a scrap coding form. After the maintenance task is complete, the programmer usually discards the list, and the next programmer to update the payroll master file goes through the entire

mental effort again.

Programmers and analysts usually do not retain documentation showing how a particular change was made; rather, they congratulate themselves that they have updated the user documentation correctly. Management should insist that any written documentation developed during a maintenance project be copied for a permanent system file. This requirement alone should save a substantial amount (Continued on In Depth/16)

# Money Grubber

(mun'ē grub' br org. OE. n. pl., —ers. adj., —ing. saver. hoarder of funds. cautious spender/investor. Neg.: cheapskate. Pos.: hero.)

**How to be a Money Grubber.** A cautious spender does business with Leasametric. You try out electronic equipment as you need it and when you need it. And for as long as you need it. No expensive maintenance and repair.

**When to be a Money Grubber.** Emergencies. Short term projects. And seasonal fluctuations all make renting the sensible solution. If you use your equipment less than 40% of the time, it's more cost effective to rent.

**Why Leasametric.** Chances are we'll have what you need and get it to you usually within 24 hours. We guarantee every piece of equipment — nearly 45,000 items from 500 top electronic manufacturers.

**Call now.** Discover that renting for a week, month or year is the most cost effective way to take advantage of the latest instruments and systems. Money grubbers save their companies long term investments on short needs. Call now and we'll help you meet your rental requirements today — you 'ole Money Grubber you.



**Leasametric**  
Rent it and Relax  
**800-227-6773**

In Calif. call (415) 576-5797. Canada: 1-800-268-6925.



#### DISASTER PLAN

##### METHODOLOGY

Over 20 major corporations have purchased our methodology in first quarter 1980.

Hundreds of companies have learned how to develop a disaster plan at our 3 day workshops.

##### 1980 and 1981

|              |             |
|--------------|-------------|
| Chicago      | Sept. 15-17 |
| Boston       | Sept. 24-26 |
| Atlanta      | Oct. 22-24  |
| Houston      | Nov. 17-19  |
| San Diego    | Dec. 10-12  |
| Key Biscayne | Jan. 21-23  |
| Anaheim      | Feb. 18-20  |

**EDP SECURITY, INC.**  
400-3 Totten Pond Road  
Waltham, MA 02154  
(617) 890-6466

## IN DEPTH

(Continued from In Depth/15)  
of time in future maintenance changes. Furthermore, with specific steps documented, the programmer and analyst will be better able to ensure the correctness of the change, which should result in fewer maintenance problems after the change is installed.

### Production Changes

A fourth area of high maintenance that is often overlooked is the question of continuous changes to production

systems. The DP manager should examine the time-accounting and personal log summaries for instances when programmers had to recompile and relink production programs.

Since production systems should be generally static, he must ask why the programming staff needs to make continual changes to keep the system running.

Are the changes designed to bypass batches of data that were input by mistake? A control card and some simple

bypass logic would accomplish the same result with much less programmer effort and time. Do the programs need to be modified to trigger certain reports and options that are not user-controlled? Perhaps the system needs a new transaction code or method for the user to select and trigger reports he needs himself.

### The Question of Control

The DP manager may wonder if he can go too far in giving up control over

certain application systems. Some analysts and DP professionals adhere to the seldom-stated but often-followed theory that certain application systems need DP staff control and that the users cannot always be trusted to handle critical aspects of production systems. They might argue that certain options and updating should be controlled by a programmer familiar with the system and its internal processing.

**'Contrary to DP beliefs, users can be trusted with their application systems if they are given proper documentation and training.'**

Such an argument ignores the real world of data processing. While a system is being developed, it is true that the programmers and analysts know the system better than any user group and would prefer to trigger critical system action themselves. After all, the system is still relatively new, and the technical people are anxious to help bring the system into full production status.

But the programmer who wrote that critical update process will eventually leave, to be replaced by a programmer who lacks not only the detailed knowledge of that particular system but also the desire to trigger a weekly update or critical report run. The new programmer treats that requirement as a maintenance burden. The original reason for preserving data processing control over that production applications systems no longer exists, and the DP staff is stuck with one more maintenance burden for the next 10 years.

A general policy should be to transfer as much system control to the user group as is practical and safe. Ideally, the user management should "control" the system without DP professional staff assistance or involvement. Contrary to some data processing beliefs, users can be trusted with their application systems if they are given the proper documentation and training.

By examining systems which do require continual programmer intervention, the DP manager can develop a plan to transfer control over the system operation from his programmers to the user groups where it belongs and correct a mistake made long ago when the system was first developed.

By following a plan to study and evaluate system maintenance activity, then, a DP manager can control and reduce his system maintenance costs. However, such a program does require hard data, such as time-accounting reports and summaries of personal logs. It is usually not wise to accept the opinions of professional staff who feel they "know" how to solve the maintenance burden, since they tend to see matters from their own personal viewpoint.

Larry M. Singer is a project leader at Informatics, Inc. in Columbus, Ohio. He holds B.A. and M.A. degrees from the University of Akron.

## TELEX SERIES 80: THE BEST TAPE DRIVE FOR 4300 SERIES PROCESSORS.

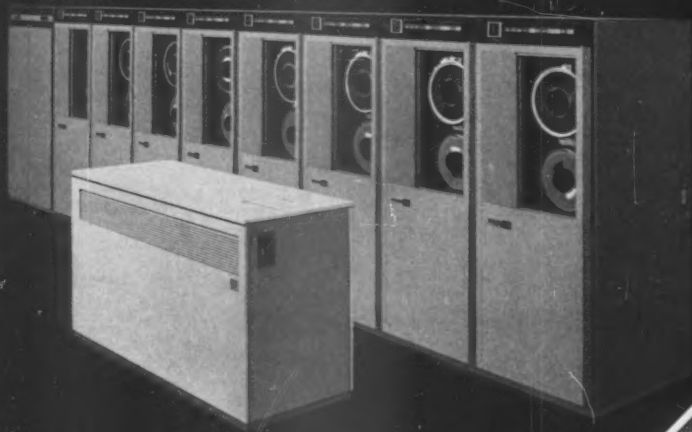
Congratulations. You've upgraded to—or at least ordered—IBM 4300 Series processors to gain major price/performance improvements and environmental enhancements. Now, what about your tape drives?

Telex Series 80 tape drives are the perfect match for 4300 processors. Like the IBM 4300, Series 80 is based on proven technology. It outperforms its competition, and is lower in price.

Series 80 drives offer 6250 bpi (GCR), 1600 bpi (PE) and 800 bpi (NRZI) data formatting—at transport speeds up to 125 ips, all with capabilities beyond those normally required on 4300's and at a price well below IBM's comparable offerings.

Series 80 is smaller and lighter than the IBM 3420 and its equivalents. Five Telex drives fit comfortably in the space normally required by four IBM drives. Series 80 also generates 30% less heat and consumes 35% less power. Patented Telex features like the Supr-Lite™ Capstan and Telex Tape Path ensure smooth, reliable back-up storage.

For more information on the tape drives made to complement your 4300 processor and other IBM systems, contact your nearest Telex representative. Or call Series 80 Marketing toll-free (800) 331-2623.



The innovation continues... **TELEX**

Telex Computer Products, Inc.  
Terminals, Peripherals, Data Entry and Word Processing Systems, OEM Products

6422 East 41st, Tulsa, Oklahoma 74135 (918) 627-1111  
332 Consumers Road, Willowdale, Ontario M2J1P8 (416) 494-4444

# DP and Security Just Aren't Talking!

By Dennis F. Poindexter

**B**urgeoning interest in DP security has come about, in part as a result of the proliferation of stories, some sensationalized, dealing with computer-assisted crime and the misuse of computer equipment.

This interest has been heightened by an increasing awareness by management of the vulnerabilities of computer-stored data, by the issues of privacy and by the increasing value of goods reduced to transferable forms.

The result: Many firms have sought to increase the protection of their computer systems. As this emphasis has increased, the security professional has been hard-pressed to keep pace with an ever-changing, technically complicated environment.

A common method of upgrading security has been to introduce DP professionals to the security staffs or assign technical specialists to augment inspection programs and auditing. This requires cooperation between two fields, security and data processing, that coexist at degrees ranging from mutual assistance to diametrical opposition. The difference in the level and intensity of cooperation is often the intuitive understanding of difficulties in communication between fields that have only recently found themselves working together.

## Oversimplified Explanation

A ready and familiar explanation for communication problems between security and DP professionals is the differences in language. However, this is a totally oversimplified and misleading factor. Although it does play a part in reducing the time necessary to develop understanding, there are fundamental differences between these two groups that are more significant and divisive than language alone.

Traditionally, DP has relied on a widespread ignorance of its functions as a built-in protective device. During the field's early stages of development this was a logical and practical ap-

proach, since there were few computers and very few people who knew the secrets of the inner workings of the machines.

While this is no longer a recognized security measure, a number of computer professionals began their training and gained their experience in an environment where security was by exception. Many of these persons are today's systems supervisors and managers. The less flexible among them still accept and expect that ignorance of their system will protect it. There is enough truth to this belief that unless — or until — the vulnerability is demonstrated by an abuse or some other event, it will persist.

The degree to which people specialize in various branches of the computer field has contributed to the belief that ignorance remains a protection. It is now almost impossible to be a computer expert. There are a myriad of distinct hardware and software areas which for simplicity, and often for protection of proprietary business interests, are intentionally protected. The usual "Help Wanted" ads of any newspaper will attest to the demand for a variety of exclusive skills.

In this environment, it becomes increasingly difficult to be a generalist except in one of the generalized areas. There is, of course, a great deal of necessary overlap between these areas, but it is a paradox that such specialization produces its own ignorance. As a result, there is a need for an increasing number of DP specialists to assist in security.

## Best Approach?

In many businesses, security and data processing are mutually exclusive. Even some of the largest corporations have established computer security sections which are made up solely of DP persons. The decision to assign these persons to security is an expeditious approach. Unfortunately, it may not be the best.

In the discussion that follows, it should be clear that there are differences in the orientation of security and DP persons and that these differences slant the view each has of his work. By limiting security sections to computer personnel, management may unknowingly cause restriction in the scope and understanding of computer security

new associates. However, the difficulties in communication between security and DP people are much more complicated than the meaning of terms. I once learned this when a DP professional, in response to a question on the impact of the addition of a particular type of hardware, said: "The answer to your question is easy

---

**There are fundamental differences between these two groups that are more significant and more divisive than language alone.**

---

problems.

Even in facilities where the security department is not responsible for data security, consultation and coordination between the two functions is common. The quality of this cooperation is affected by the ability of persons in each field to relate to the other.

The importance of this communication cannot be overlooked. The technical knowledge of persons outside the facility is growing. Today, with high school sophomores writing programs and building hardware, the number of technically qualified potential abusers is increasing dramatically. Computer security, as a consequence, is an urgent concern and preventive measures require cooperation between security and DP.

The question then becomes how to express security problems to data processing persons and how they, in turn, should express the technical issues impacting on security.

The language barrier is only part of this problem. We all tend to use terms common to our field. We all expect a certain amount of adjustment in learning the language of a new office or

enough, but I wonder why you asked it."

This represents a fundamental difference in orientation. It is caused, in part, by previous experience with security measures, but to a greater extent, by the differences in levels of abstraction in these fields. This is not a matter of knowledge or language, but of the focus of both.

Hiyakawa<sup>1</sup> described levels of abstraction using the example of a cow. At one level, the animal is molecules and atoms, then flesh, skin and bone, then an object, labeled "Bessie"; then a Holstein; then a cow and so forth. Persons speaking about Bessie are going to lose the message, or part of it, when they operate at different levels.

## Level of Abstraction

With a complex field like data processing, one is tempted to say that the computer specialist operates at a higher level of abstraction than the security specialist, but this issue is far more complicated.

The diversification of computer technology has meant a high level of ab-

(Continued on In Depth/18)



## IN DEPTH

(Continued from In Depth/17)

traction in specific specialties, but not necessarily a higher general level. This is a relative distinction for the security specialist looking into the DP field, but one that deserves recognition.

The second point is that the security person brings his own level of abstraction with him — one, incidentally, divergent from data processing. Security is by far a more generalized field. While there may be wide technological specialization, the orientation of secu-

rity demands a broader perspective. A security specialist is more of a generalist than a computer specialist. Thus the level of abstraction is generally higher in the security field than in data processing. This is not particularly important until these divergent fields are forced to establish policy and work together.

### Differences in Perspective

The fact is that both sides have to recognize these differences in perspec-

tive. This is, unfortunately, often a time-consuming process; in many cases, it is never resolved.

For example, suppose the problem of "access" comes up. This is a familiar term in both fields, but the concept is viewed differently in each. The security specialist may consider that access begins with entry controls at the front door and goes down to authorized users with passwords. Generally, however, the DP specialist thinks of access as it relates to the data base. Use of a

device may not qualify as access to the system if a user is denied it by software features. The difference in approach may cause untold days of discussion if the definition of terms is not settled in the beginning. Note that it is not only definition of the term "access" that is required, but also the level at which the discussion is to be bounded.

### Different Products

Another matter related to levels of abstraction is the orientation of the fields to different products. The DPer is oriented to efficiency of operation. At almost every level of the business, speed and accuracy are stressed.

The security specialist is also oriented to efficiency, but the field is not. Were there no need for security, every phase of business would be affected. Every aspect of security requires certain restrictions which impact efficiency and limit its scope. Security works toward a tolerable restraint to management's specified limits. Data processing works to eliminate whatever restraints are placed on its efficiency. This is not to say that a DPer would intentionally subvert security, only that the orientation to restraint is not as great.

This is particularly important when attempting to establish policy for computer security. The area of hardware maintenance is a good example.

Most installations do not have the capability to hire a maintenance specialist for each type of DP equipment they use. This is obviously impractical.

When equipment malfunctions, the operators lose productive time, and expensive equipment is idled. The maintenance person is needed quickly and must be able to expeditiously locate and repair the problem.

Security is interested in a number of restrictions to this technical specialist. Not just anyone can be admitted to the business. He must be identified as a person sent by the repair function. Second, there may be proprietary information in the plant (it may be in the computer) which the facility would not want removed, observed or destroyed.

Perhaps an escort is to be provided. This is a complicated issue because few people, and least of all security, understand what needs to be done to affect repairs. A reasonably knowledgeable representative is required to monitor a visitor. Maintenance persons often test and replace various component parts using diagnostic routines and analyzers. Many of these have recording functions or remove recorded media. This can be extremely complex where critical proprietary or classified defense information is being secured. The computer staff is not very amenable to restrictions placed on getting the hardware back into working order, but the business must make certain concessions to protect its wider interest.

Consultants, too, may find more and more restrictions placed upon them in spite of the fact that they are often hired to increase efficiency.

The difference in orientation of security and data processing is not easily

## COMPUTERWORLD can't cover all of Info 80 in **one** issue. That's why we're covering it in **two!**

October 6th      Info 80 Show Issue  
October 13th    Info 80 Wrap-up Issue

**Computerworld** will bring you two-part, total coverage of the most important information equipment show in the East. Info 80 will be held again this year at the New York Coliseum, October 6th-9th. A heavy turnout is assured with a record audience of between 22,000 and 25,000 corporate executives, DP managers and administrative managers—Plus, there'll be more than 200 exhibitors, 250 speakers and 80 sessions.

**Computerworld** will have up-to-the-minute coverage of Info 80 in our October 6th issue. And in our October 13th Wrap-up issue, you'll read what went on in those four days, compare the best ideas of the best minds in the industry and find out not so much how a product works but what it can do for you.

We also have a booth there, so if you're going, stop by #2523 for a free copy of our Show Issue. It'll outline the high points of the show—exhibitors, speakers, special events—along with a guide to night life in New York. Ad closing dates for these two special issues are shown below.

If you're aware of the revolutionary changes taking place in the use of information systems and the impact they can have on your business—you can't afford to miss this two-part total coverage. And if you're exhibiting, be sure to put your ad in both of these issues. Your **Computerworld** representative can give you full ad planning assistance. Or, to reserve space for your ad, call Frank Collins at (617) 879-0700.

|                            | Color & Insert Close | B&W Close      |
|----------------------------|----------------------|----------------|
| October 6th Show Issue     | September 19th       | September 26th |
| October 13th Wrap-up Issue | September 26th       | October 3rd    |



**COMPUTERWORLD**  
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

**Boston**  
Bob Ziegel  
Chris Lee  
Ed Marecki  
Kathy Doyle  
Susan Wolffe  
(617) 879-0700

**Chicago**  
Dave Dolber  
Bob Ziegel  
Jane Wrightman  
(312) 782-7565

**New York**  
Don Fagan  
Mike Masters  
Peter Senft  
Candy Kelly  
(201) 967-1350

**San Francisco**  
Bill Healey  
Barry Millone  
Bob Stetson  
Ruth Gordon  
(415) 421-7330

**Los Angeles**  
Jim Richardson  
Bob Hubbard  
Kathy Knox  
(213) 450-7181

## IN DEPTH

resolved. Each viewpoint tends to have its own momentum which continues to divide the fields. In interpersonal communication there is a well established principle of "set" which, in this instance, works against cooperation.

In this instance, there are two fields with different experience upon which decisions are made. The experience creates expectations about an anticipated event, and inputs from a source which do not fit these expectations are likely to be ignored.<sup>3</sup> This has serious implications for security. Security systems are many times cued to particular events which indicate an unusual occurrence and may be a key to an attempted system penetration. Ignoring these keys will increase the number of attempts at entry to a system and give a greater chance of success. A simple example will illustrate this point.

#### Typical Situation

In most systems, some type of file protects are used to restrict access. Passwords are a common means of limiting this access. In theory, every person should be able to enter a password on one attempt, but practicality allows for more than one. After this number, software features can be used to lock out the originating terminal, or in the more sophisticated systems, the terminal is identified to the operator console and kept on line so that its activity can be monitored.

The trouble with any such system (and most mechanical/electrical entry systems) is that it usually works. Every time the passwords are changed, that well-known "10% who never get the word" start showing up, operators are busy with jobs, hardware goes down and software doesn't always work as it should. These are typical everyday problems.

There is an unfortunate inclination to believe in the familiar. The terminal on the fourth floor locks out. Dave calls to say he is locked out and needs to get data for Jim up in Production. The corporate procedure calls for an investigation, but this is the second time today and ... the software probably isn't right. Maybe all the changes weren't made. To an experienced security officer, this is all too familiar.

In computer systems, the problem is aggravated by continuous system failures of all types. If everything worked properly, we would set up a computer

system and never have to worry about it, but it seldom does. The anomaly is common and frequent. Operators are attuned to these occurrences and make the "obvious" assumptions about the cause.

The difference between a very good security patrolman and the average is often that the good one notices something out of the ordinary and has the patience to follow through in an investigation. If the computer operator did the same, that person might well be

working elsewhere in a week or two.

The three major areas of discussion — level of abstraction, orientation and the momentum of sets — are the elements of an environment not conducive to high levels of cooperation. If recognition were a panacea to resolving all differences, it would be sufficient to state fundamental differences and let intuitive understanding lead to cooperation. But in practice, recognition is not enough.

Some believe there is a choice be-

tween making a computer security specialist from a computer expert or a security specialist. The comment is generally made that it is easier to make a computer security effort by using DP-experienced persons. These comments are voiced by persons with a computer background.

But there are enough conceptual differences in the two fields that there is a need for both. They each have something to bring to the other. Because of

(Continued on In Depth/20)

## OUR FAST NEW PRINTER FOR YOUR IBM 3270:

### MORE OUTPUT. LESS OUTLAY.

At 150 cps, Decision Data's new 6541 serial printer is faster than all of IBM's serial printers. And it costs less.

Our higher speed means more output. Our buy/rent/lease prices and terms mean less outlay.

To repeat, the printing speed of our new 6541 serial printer is a fast 150 cps. IBM serial printer speeds are 40, 66, 80, and 120 cps.

But you don't want to print faster just to finish sooner. You want to be able to get more done in a work day.

Compare: With our printer you can do 3.75 times as much as their 40 cps units, 2.27 times as much as their 66 cps units, 1.87 times as much as their 80 cps units, and 1.25 times as much as their 120 cps units. At the least, you get two extra hours output in an eight hour day.

**The less money part.** You'll save. But the saving will depend on what you're replacing, and the terms.

For an outright purchase, we can save you as much as \$3,200 on each unit. With our five-year lease/rental — a term IBM won't discuss — you could come out more than \$4,000 ahead.

But these numbers are just to give you an idea. Talk to us. We'll quote specific dollar savings for you.

**We have more to offer.** If our new 6541 doesn't have what you need, don't give up. We have many more printers and terminals in our line which merit your consideration.

**Fast, expert service, too.** While we save you money, we won't leave you without service. We're near, wherever you are. We have more than 250 Field Engineers, working out of 70 locations, ready to respond at the drop of a dot.

For more information, call 215-674-3300. Or write — Decision Data Computer Corporation, 100 Witmer Road, Horsham, PA 19044.



**DECISION DATA**  
CORPORATION  
makes computing cost less

#### LEASE SHORT/LONG TERM

IBM System 38



IBM System 34

All Peripherals for Both Systems

**DDCP** Leasing Corporation  
1200 Broadway, New York, N.Y. 10001  
(212) 875-1777  
2000 Augusta Drive, Houston, Texas 77057  
(713) 875-0000

# DP AND SECURITY NOT TALKING

In Depth/20

## IN DEPTH

(Continued from In Depth/19)

the technical complications of the computer field, it becomes difficult, if not impossible, for a single person to be a computer security expert. It becomes more and more important to develop a team approach to bring the backgrounds of both to work.

Donn Parker once described the areas required in an audit to achieve a satisfactory result. Although the auditing function is a limited portion of total computer security, the problem remains. Parker said: "The areas of specialty include physical security, operational security including recovery and backup application analysis and programming, systems programming and electronic engineering. This implies a team approach to auditing to achieve the necessary depth of expertise in these diverse areas."

Another related publication of the Rand Corp. stated: "The security problem of specific computer systems must be solved on a case-by-case basis employing the best judgment of a team consisting of systems programmers; technical, hardware and communications specialists; and security experts."

Unfortunately, no single person can be responsible for all computer security. Even agreeing that more than one person is necessary and bringing both security and data processing together is not enough.

A natural tendency between differing groups is for them to become defensive about their respective positions. During the development of policy there is little room for provincialism and egalitarian responses. These may be partly the result of an understood difference in status of the participants.

The computer mystique has its re-

wards, for all its difficulties. It is not easy to compensate for the high regard that computer specialists have; security, except in rare instances, has operated with less money, emphasis and status. Where the high-stakes corporate interests are at issue, cooperation on an equal basis is essential. There must be recognition that policy will be made through a variety of inputs which may be logically considered.

This requires a belief in the worth of persons who have to work together. The person or office which is to direct computer security must ensure that the corporate interests are placed above whatever differences in policy develop. Initially this may be easy enough, but over a period of months impingements on efficiency take a quick toll on DP and the technical details of computer systems can slow the best security professional. It is easier to compromise the computer security program than to face the fact that there are acknowledged differences that take time and frank discussions to resolve.

### Management's Duty

Management's responsibility in resolving differences is to define what level of restraint is acceptable and what information is to be protected. One might believe that this is a necessary first step, but "agreeing to agree" is a satisfactory beginning.

Defining the level of restraint is a complex problem in which decisions must be made on the nature of the threat to the data base. Security has resources to develop many of the known threats and the general types of corporate information being protected. Data processing can relate this information to what is on the computer system and make realistic inputs on the types of

threats most easily carried out.

The second facet of this is to decide what information is most important and deserving of the greatest protection. In data processing, management may neglect to designate what information is to be backed up, leaving this decision to the systems managers. It may not occur to them that what is essential to restoring the computer system may not be the same information necessary to restore the business. In the same way, protecting everything at the same level is protecting the most important information at the same level as the least important. Just as there are limits on the backup capability, there are limits on how much can be protected.

Once these matters are resolved, the technical nature of the discussions will become more apparent.

### Most Prevalent Problems

In this, the problems of abstraction, orientation and set are most prevalent. Here too is the legitimate problem of language — linguistics and abstraction. By sheer weight of volume, the burden largely falls to security, but it is equally important for the data processing professional to realize that "computer security" is two words. Security has its own set of terms not easily understood and there is an equal responsibility to discuss them.

Although there are arguments to the contrary, considering the state of the art, computers are not very secure. Demonstrations by the somewhat obscure tiger teams have shown that a number of techniques, both simple and sophisticated, make it possible to extract data from a system without authorization.

In security, it is generally preferable

to prevent crime, but if that fails, to detect it. Computer security has changed the latter goal. The careful theft of data is much like the "theft" of important papers by photographing them and returning them to their rightful place. There is not evidence of a loss and no cause for concern. The problem, then, is to make this as difficult as possible. We are getting better at this — but only through extensive cooperation between people who are conceptually attuned to both security and data processing.

### References

1. Hayakawa, S.I., *Language in Thought and Action*, Harper and Row, 1957.
2. Rogers, C.R., *"A Theory of Therapy, Personality and Interpersonal Relationships" as developed in the client-centered framework*, Psychology: The Study of Science, McGraw-Hill Book Co., 1969. Also, *On Becoming a Person*, Houghton Mifflin, 1961.
3. Parker, Donn, "Computer Security: Some Easy Things to Do," *Computer Decisions*, Hayden Publishing Co., January 1974.
4. Ware, Willis H. (Ed.), *Security Controls for Computer Systems*, The Rand Corp., February 1970.

Dennis F. Poindexter is an industrial security specialist with the Defense Logistics Agency (DLA) in Indianapolis.

Poindexter, who has been involved in systems security for 12 years, holds a B.S. degree from the University of Wisconsin (Madison).

The views expressed in this article are those of the author and do not necessarily reflect those of the DLA.

## FOCUS: The English-language information control system.

FOCUS is a high-level, English-language software system for on-line report writing, applications development and data base management.

FOCUS can develop complete applications faster than any other system available. Non-programmers using FOCUS can learn to make basic queries within hours and write ad hoc or formatted reports in a day. Systems designers can write complex self-documenting applications in up to one-tenth the time required by procedural languages. Either way, FOCUS eliminates data production bottlenecks.

Using relational file structures to link individual data fields in separate files, FOCUS reduces data redundancy and data file dependence. Whether you use FOCUS data bases or your own existing files — such as IMS, IDMS, VSAM, and ISAM — the same English-language report writer is available. FOCUS operates in an interactive environment (CMS/TSO) on IBM 370, 4300, or equivalent mainframes.

Over 400 major companies, institutions and government facilities are using FOCUS to prepare reports, financial models, statistical analyses, and graphs to process information rapidly and make informed decisions. Among them are: J.C. Penney, ITT-Continental Baking, Merrill Lynch, RCA, Yale



University, and the U.S. Army Corps of Engineers.

Typical applications are in: personnel, finance, general administration, marketing, sales, research, results tracking, manufacturing, and customer service.

FOCUS can save you time, effort, and money. For more information, call or write for our brochure.

**FOCUS**

Information Builders, Inc., 1250 Broadway,  
New York, N.Y. 10001 (212) 736-4433

## Free FOCUS Seminar

Information Builders invites you to attend a comprehensive seminar for systems designers, applications writers and information users.

The seminar will concentrate on FOCUS'... English-language report writer and query language; accommodating relational, networked and hierarchical data structures; and simplified non-procedural data management and maintenance. Seminar locations are:

- Sept. 23, Los Angeles, Ca.
- Sept. 25, Orange County, Ca.
- Sept. 30, Pittsburgh, Pa.
- Oct. 2, San Francisco, Ca.
- Oct. 6, Hartford, Ct.
- Oct. 9, Newton, Ma.
- Oct. 9, Houston, Tx.
- Oct. 15, New York, N.Y.
- Oct. 14, Seattle, Wa.
- Oct. 20, Philadelphia, Pa.
- Oct. 24, Chicago, Ill.

For reservations, contact  
Information Builders today.  
(212) 736-4433.



# Is DDP Right for You? — Part 1

## Determine Need for On-Line Processing

By Lawrence C. Hartge Jr.

Special to CW

Much has been said about the benefits of distributed data processing (DDP). Defined as a system in which a group of computers and communication lines dynamically share data and processing, DDP can combine the central control and economies of scale of centralized processing with the system tailorability and timely access to data of decentralized systems.

However, because DDP is a broad and flexible concept, it is often difficult to determine its real value — if any — for your own particular environment.

If you are considering a move to DDP, there are five criteria that will help to determine whether DDP is right for you. If more than one of these criteria is applicable to you, DDP deserves a closer look.

These criteria are the need for interactive processing, the 80/20 work load, the need for local accountability, organizational structure with dispersed functions and rapid

company growth.

If you have no need for on-line processing, then DDP is not for you. If you do need an interactive system, however, DDP can often be much more cost-effective than a central-

*DDP can hardly be called a new concept, but the controversy over centralization vs. decentralization is still going on. This two-part series provides five criteria for determining whether DDP is right for your organization.*

ized system.

The underlying principle of distributed processing is that processing power should be placed where it is needed most or where the job can be performed most effectively. It frequently makes much better business sense to have local data storage which can be

directly accessed and updated and to send summary information to headquarters on a "need-to-know" basis than to use expensive communication links to stay on-line to a centralized system.

Moreover, if you need fast response time yet have a large terminal population or heavy data traffic, then a distributed system may be essential. Otherwise the central computer could easily be overloaded and overall processing speed reduced.

If it is crucial that your on-line system provide uninterrupted service, then you will definitely be a candidate for DDP. Having most of the processing power distributed where it is needed is a safeguard against the communications outages possible with a centralized on-line system.

Thus a company with distributed systems in its sales offices, for example, can continue to take orders from customers even if phone lines to the mainframe are down. And if a local processor itself goes down instead of the phone lines, processing power is not lost as it would be with a centralized system, since the other processors in the network can be used as backup.

### Local/Remote Ratio

If on-line interactive processing is required, this second criterion for DDP will probably also be applicable. Under this rule, DDP makes economic sense when 80% of the processing is done locally and 20% remotely.

In this situation, distributed processing will usually be much more efficient than centralized processing. Data transmission costs can be significantly reduced, since only summary data is passed to the central computer.

The slow response time of the central com-  
(Continued on Page 62)

## HP Graphics Input Tablet Allows Drawing on CRT Screen

PALO ALTO, Calif. — A graphics input tablet suitable for drawing on a CRT screen, tracing graphics documents or picking from a menu has been introduced by Hewlett-Packard Co.

The HP9111A features user-definable softkeys, ceramic platen, lightweight stylus and programmable data rate. It was designed



The HP9111A

for applications in interactive graphics, graphics entry and menu selection.

Interfaced through HP-IB, HP's implementation of IEEE Standard 488-1978, the tablet is compatible with a wide variety of HP computers, including the HP-85 personal computer, the 9800 series of desktop computers and the HP family of technical mini-computers, the vendor claimed.

The HP911A is priced at \$1,950 from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

## CDC, HP CPUs Run Calcomp Plotters

ANAHEIM, Calif. — California Computer Products, Inc. has released two plotter control interfaces that reportedly permit Hewlett-Packard Co. 3000 and Control Data Corp. Cyber 18 CPUs to use most Calcomp plotters.

The interfaces are single-printed circuit cards that mount in Calcomp's 907 on-line controller.

The interfaces give HP 3000 and Cyber 18 users access to drum and beltbed plotters that offer plot widths from 11 to 72 in. and plotting speeds up to 30 in./sec, the vendor said.

The HP 3000 interface costs \$5,740 and the Cyber 18 interface costs \$6,140, the vendor said from 2411 W. LaPalma Ave., Anaheim, Calif. 92801.

## No-Nonsense Traffic Cop

The Beall Channel Switch. Prevents computer traffic jams by directing critical on-line services to another CPU when failure occurs. Allows specific peripherals to serve more than one computer. Redrives all CPU signals to give you far more flexibility for physical placement of peripherals.

And Beall does all of this less expensively, more reliably and with less opportunity for operator confusion than anyone else.

We make five basic models to provide up to eight switchable interfaces each of which can be logically connected to as many as eight CPUs.

Want to summon more facts? They're in our new brochure. Write or call for it today.

**John Beall & Company, Inc.**

9103 Third Avenue • North Bergen, N.J. 07047 U.S.A. • 201/854-3562



# Look Again at DDP if On-Line System Needed

(Continued from Page 61)  
puter, flooded by data from every division or department, will be replaced by instant interactive access to the local data base.

Local management decisions will be based on timely and accurate information, and top management will still receive the integrated summary data it needs. With a capable network, headquarters can remotely access data without local operator intervention.

*'Hardware is not the only system resource easily shared in a distributed system. Program development personnel can be centrally located.'*

In general, the 80/20 rule means that one should distribute the processing power to where the work is done or the results are needed.

## Economies of Scale

But what about so-called economies of scale?

When applying the 80/20 rule and implementing DDP, can one achieve the same economies of scale that seem to be evident with a centralized system — the savings in hardware, program development and maintenance of software and hardware?

The answer — to a great degree — is yes, because DDP allows the sharing of many system resources. Processors themselves can be shared, so that an application program can be processed on the hardware best suited to it.

For example, scientific data can be analyzed most efficiently on a system with a scientific instruction set and a floating-point processor. But the processors used for gathering the data need not have these capabilities.

It is only necessary to transmit the data to the scientific system for processing, thus lowering total costs while making greater capabilities available to each site.

The same principle applies to the sharing of expensive peripherals, such as high-speed printers, plotters, large disk drives and magnetic tape units.

While it is true that DDP requires more processors than a centralized system, these processors are generally smaller and less expensive. In addition, hardware costs are dropping so rapidly that by 1985 they are projected to be only 10% to 20% of the typical DDP budget.

## Shared Resources

Hardware is not the only system resource easily shared in a distributed system. Program development personnel can be centrally located and

yet develop programs for use at many sites.

New software is transmitted through the network to the computer that will be using it. In the same way, software needing to be debugged can be transmitted to a software engineering group at one location.

In effect, those program development and software engineering people are "shared" through the results of their work: application programs.

In addition to sharing application software, even hybrid software — consisting of software and firmware — that cannot be copied may be shared.

If this software is an advanced compiler, for example, all programs in that language can be compiled on one system, and the compiled program transmitted back to the system on which it will be run.

Thus, an extensive sharing of system resources is made

possible by the communications network connecting the processing nodes in a distributed system.

Another major benefit of applying the 80/20 rule in a DDP environment is that projects can be managed much more effectively. The magnitude of the applications running on DDP systems is considerably smaller than applications running on a centralized mainframe.

Smaller, more manageable projects tend to be completed in a more timely fashion without associated cost overruns.

The remaining three criteria — local accountability, organizational structure with dispersed functions, rapid company growth — which should be assessed in DDP decision making will be explored next week by Hartge, who is with the General Systems Division of Hewlett-Packard Co.

## Are you about to buy a space age On-line system with a stone age printer?





## Dema Spotlights Productivity

ORLANDO, Fla. — "Improving Productivity and the Quality of Working Life for Data Entry" will be the theme of the Fourth Annual Data Entry Management Association (Dema) Conference to be held here Nov. 10-13.

Fifty sessions will cover such subjects as distributed data entry, the office of the future, alternatives to traditional data entry, management and communications and equipment evaluation.

Addressing productivity from the industry's point of view will be Ryal Poppa, president and chief executive officer of Per-

tec Computer Corp. Also scheduled to speak are Donald Brosnan, president of MSI Data Corp., Gary E. Liebl, president of Microdata International, and Raymond Kurzweil, president of Kurzweil Computer Products.

Equipment exhibitors will include IBM, Univac, Advanced Systems, Computer Devices, Consolidated Computer and Infotex.

Individual fees for the conference are \$300 for Dema members and \$345 for nonmembers; team fees (three or more) are \$270 per Dema member and \$315 per nonmember. Dema can be reached through P.O. Box 3231, Stamford, Conn. 06905.

## Plessey Disk Subsystems Emulate DEC's RP11-C

IRVINE, Calif. — Plessey Peripheral Systems has introduced an array of computer subsystems that emulate Digital Equipment Corp.'s RP11-C and utilize Plessey's PM-DC1100 controller.

The subsystems provide compatibility with the line of system software for RP series expansion and the controller features transparent EEC and multiword transfers.

It can be cabled directly to one or two drives; with a multidrive interface chassis, the controller can support up to eight drives.

### Combined Controllers

When the PM-DC1100 is combined with the PM-FD11/G Winchester disk drive, it becomes the PM-FS11/G Winchester disk subsystem.

Using a multidrive interface chassis, a single PM-DC1100 controller supports up to eight 25.3M-byte drives over 200M bytes of data storage utilizing the Winchester technology, the vendor claimed.

The PM-FS11/G Winchester Disk subsystem is available for \$7,442.

Plessey is located at 17466 Daimler Ave., Irvine, Calif. 92714.

## Free Brochure Treats Recovery, Disaster Backup

WAYNE, Pa. — A free brochure written to help DP professionals in large computer-dependent organizations evaluate disaster recovery backup options is available from Sun Information Services Co.

Entitled "When Management Asks about Computer Disaster Backup and Recovery, What will You Tell Them?" the 10-page publication uses a question-and-answer format to review possible risks and complications to computer operations in emergency situations.

The brochure is available from Sun, 656 E. Swedesford Road, Wayne, Pa. 19087.

## ICE, Inc. Supplies Printer Service

ELMHURST, Ill. — ICE, Inc. has announced the establishment of two national maintenance services for Printronix, Inc. and Data Printers Corp.

The firm will handle maintenance for the full line of Printronix printers and the data printers' Chaintrain line.

A full service maintenance contract for either company can be obtained from ICE at 772 N. Church Road, Elmhurst, Ill. 60126.

## Template Offered

SAN LEANDRO, Calif. — Levitt Products Co. is offering an overlay template designed for software, drafting or graphics DP personnel.

The templates are available in 10 char./in. by 8- or 6-line/in. and cost from \$34 for large versions and \$21 for smaller templates.

The vendor can be reached at P.O. Box 4308, San Leandro, Calif. 94579.

Today, a lot of people can sell you basic, 3270-type On-line hardware. But only Northern Telecom's On-line system has the Sprinter™—a printer designed for all the new ways people use On-line.

### Complicated printers are out-of-date.

When On-line systems work far from the DP room, you need a printer that's fast and easy to use. Sprinter is microprocessor controlled. So margins, alignment and spacing are adjustable with push buttons—even while you're printing.

The Sprinter is quick—up to 180 cps—so it doesn't keep people waiting an extra second.

Everyone stays clean around the Sprinter, because you can load paper—even change ribbons without making a mess.

### Short forms in short order.

When your printout is tickets, or leases, or other short documents, you want a printer that handles cut forms as easily as it handles continuous rolls. Sprinter's front-feed module adjusts quickly and easily for cut forms of many different sizes.

When your printout is read by customers—or by top management, you need crisp, sharp, easy-to-read copies. With the Sprinter, your fifth carbon is just as presentable as the original.

### Compatible. Economical. And ready to go.

You don't have to give up a thing to get the On-line system with the up-to-date printer. Our hardware is plug-compatible with IBM 3270s. Our price is competitive. And so is our delivery schedule. So if you want the option of adding a simple, high-quality printer someday, our On-line hardware could be a very smart buy. And if you're depending on your printer right now—it's a must.

### Our bigger choice is another reason why we're a better buy.

Right now, we can deliver state-of-the-art systems for DDP, Data Entry, and Remote Job Entry as well as On-line. So when you work with Northern Telecom, one phone call can bring you factory-trained service for every part of your remote processing operation.

### But the best reason to talk to Northern Telecom today, is tomorrow.

We're combining data processing expertise with telecommunications expertise—in a mix no other company can match. Today, it means better access to all the processing power you pay for. Tomorrow, it means a smoother transition to a single system that will meet all your processing and telecommunications needs. Talk to Northern Telecom Systems Corporation. Where computers and communications meet.

For the office nearest you, call our Marketing Services Department at 1-800-328-6760. In Minnesota call (612) 932-8202. Or write Northern Telecom Systems Corporation, Box 1222, Minneapolis, MN 55440.

**nt** northern  
telecom  
**Northern Telecom  
Systems Corporation**



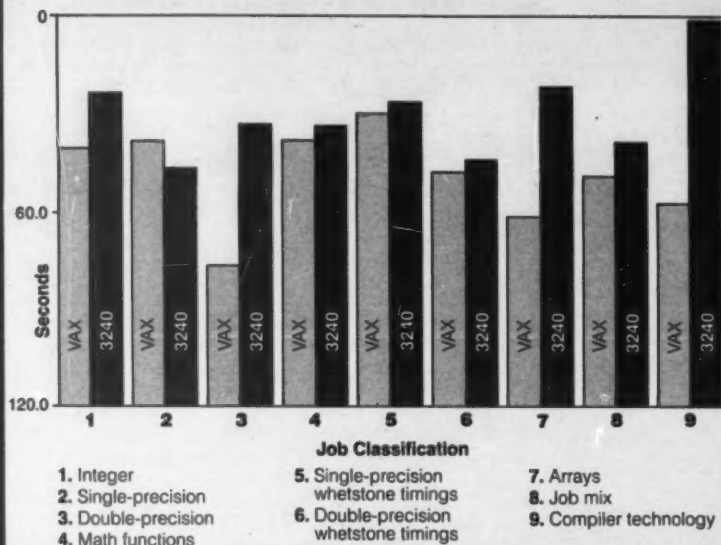
# The benchmarks prove it...

## 1. Performance Measurements

| Benchmark Name | VAX 11/780 CPU time | Perkin-Elmer 3240 CPU time | Performance Ratio* |
|----------------|---------------------|----------------------------|--------------------|
| PMS0154        | 1.140               | 0.907                      | 1.26               |
| PMS0254        | 4.710               | 4.485                      | 1.05               |
| PMS0354        | 9.160               | 8.990                      | 1.02               |
| PMS0454        | 43.610              | 43.451                     | 1.00               |
| PMS0554        | 86.420              | 86.123                     | 1.00               |
| PMS0664        | 1.610               | 1.350                      | 1.19               |
| PMS0764        | 7.040               | 6.679                      | 1.05               |
| PMS0864        | 13.730              | 13.370                     | 1.03               |
| PMS0964        | 66.830              | 66.068                     | 1.01               |
| PMS1064        | 132.920             | 129.727                    | 1.02               |
| PMS1124        | 1.520               | 1.306                      | 1.16               |
| PMS1234        | 2.470               | 2.424                      | 1.02               |
| PMS1324        | 1.310               | 1.618                      | 0.81               |
| PMS1407        | 251.560             | 37.327                     | 6.74               |
| PMS1507        | 50.260              | 57.657                     | 0.87               |
| PMS1674        | 22.440              | 23.005                     | 0.98               |
| PMS1724        | 52.550              | 53.133                     | 0.99               |
| PMS1807        | 50.180              | 34.766                     | 1.44               |
| PMS1907        | 32.020              | 34.679                     | 0.92               |
| PMS2007        | 17.720              | 20.264                     | 0.87               |
| PMS2107        | 13.450              | 20.242                     | 0.66               |
| PMS2202        | 33.311              | 26.352                     | 1.26               |
| PMS2324        | 121.610             | 137.997                    | 0.88               |
| PMS2402        | 0.940               | 0.539                      | 1.74               |
| PMS2502        | 0.720               | 0.562                      | 1.28               |
| PMS2624        | 122.920             | 227.689                    | 0.54               |
| PMS2708        | 4.850               | 0.961                      | 5.05               |
| PMS2809        | 103.770             | 0.006                      | 17295.00           |
| PMS2934        | 0.660               | 0.414                      | 1.59               |
| PMS3009        | 0.230               | 0.006                      | 38.33              |
| PMS3103        | 0.610               | 0.398                      | 1.53               |
| PMS3202        | 4.740               | 3.923                      | 1.21               |
| PMS3307        | 2.470               | 1.959                      | 1.26               |
| PMS3407        | 39.190              | 7.774                      | 5.04               |
| PMS3507        | 5.580               | 2.587                      | 2.16               |
| PMS3607        | 156.540             | 20.077                     | 7.80               |
| PMS3701        | 4.480               | 1.621                      | 2.76               |
| PMS3802        | 4.060               | 2.874                      | 1.41               |
| PMS3903        | 6.050               | 3.864                      | 1.57               |
| PMS4002        | 9.330               | 5.505                      | 1.69               |
| PMS4102        | 76.290              | 77.764                     | 0.98               |
| PMS4202        | 118.490             | 125.039                    | 0.95               |
| PMS4301        | 110.650             | 75.569                     | 1.46               |
| PMS4403        | 1.990               | 0.739                      | 2.69               |
| PMS4584        | 219.990             | 189.081                    | 1.16               |
| PMS4603        | 18.640              | 16.939                     | 1.10               |
| PMS4701        | 0.350               | 0.077                      | 4.55               |
| PMS4802        | 0.830               | 0.880                      | 0.94               |
| PMS4934        | 0.340               | 0.050                      | 6.80               |
| PMS5008        | 0.430               | 0.168                      | 2.56               |
| PMS5108        | 98.950              | 55.419                     | 1.79               |
| PMS5208        | 0.900               | 0.917                      | 0.98               |
| PMS5308        | 0.330               | 0.029                      | 11.38              |
| PMS5408        | 2.080               | 1.697                      | 1.23               |
| PMS5502        | 1.130               | 2.180                      | 0.52               |
| PMS5602        | 207.140             | 196.685                    | 1.04               |
| PMS5703        | 585.170             | 254.545                    | 2.30               |
| PMS5824        | 18.740              | 18.194                     | 1.03               |

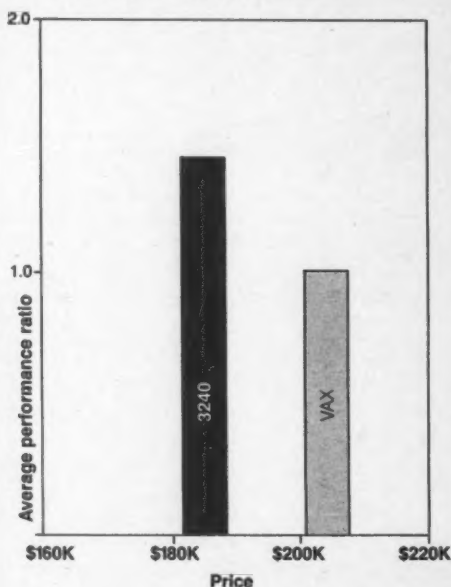
\*Performance Ratio =  $\frac{\text{VAX 11/780 CPU time}}{\text{Perkin-Elmer 3240 CPU time}}$

## 2. Perkin-Elmer 3240 vs. VAX\* Average Time by Job Classification



\*VAX is a trademark of Digital Equipment Corporation.

## 3. Proven Price/Performance



The configurations tested were 2 MB of memory, 67 MB disc, 75 ips tape, Floating Point Processor, CRT terminal, battery backup, and system software. The 3240 had a Writeable Control Store and Fortran Enhancement Package, while the VAX 11/780 had a Floating Point Accelerator.

# The Perkin-Elmer 3240 is Faster than VAX.

**Our 32-bit Model 3240 performed 44 out of 58 benchmark tasks faster than the more expensive VAX 11/780.**

We matched our Model 3240 against the VAX 11/780 in 58 customer supplied benchmarks, comprising 697 million FORTRAN statements.

In 44 of the benchmarks, the 3240 performed *faster* than VAX.

Overall, the 3240 delivered an average 1.4 times higher performance.

Yet the 3240 configuration costs approximately \$20,000 less than its corresponding VAX configuration.

All 58 FORTRAN benchmarks listed in Table 1 were submitted by our customers and prospects reflecting their application needs. Applications that deal with the same kind of problems you face every day.

All benchmarks were run on-site at various locations across the country. And all were run by vendor-trained operators.

In Table 2, we organized the benchmark results into nine common types of job classification, so you can see at a glance how the 3240 stacks up vs. VAX 11/780. (The ninth classification demonstrates the superiority of Perkin-Elmer's system software, in this case globally optimizing FORTRAN VII.)

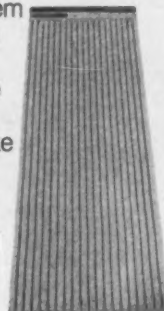
As shown in Table 3, the story is simple and uncomplicated. The

Perkin-Elmer 3240 outperforms VAX 11/780. And it costs less.

The 3240 is faster than VAX in another important way—we can deliver it faster.

We'd be happy to send you a sub-set of those benchmarks which are non-proprietary or have been released with permission, so you can run them yourself. We'll also send you hardware and software documentation.

Before you make a decision on any supermini system, get all the facts on the new 3240 from Perkin-Elmer.



The Perkin-Elmer Corporation, Marketing Communications,  
2 Crescent Place, Oceanport, NJ 07757

Please send me ☐ complete information on the 3240  
☐ documentation ☐ a sub-set of benchmarks.  
☐ Have a salesman call.

Name \_\_\_\_\_ Tel. \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

CW98

**Call toll free: (800) 631-2154**

**In NJ: (201) 229-6800**

**PERKIN-ELMER**

## Sprint 5 Gets Feeder, Stacker

SAN JOSE, Calif. — A cut paper feeder and stacker for Qume Corp.'s Sprint 5 terminal has been announced by the firm.

Designed with new electronics and the same mechanical structures as the Qume Speedfeed, the Speedfeed 5 is a single hopper feeder that automatically stores, inserts, ejects and stacks up to 220 sheets of paper in a variety of sizes, the firm said.

Installation of the Speedfeed 5 may require upgrading of some systems by a Qume service dealer. The feeder and stacker costs \$1,000 with 30-day delivery from Qume at 2350 Qume Drive, P.O. Box 50039, San Jose, Calif. 95150.

## Color Graphics Printer Has Built-In Auxiliary Computer

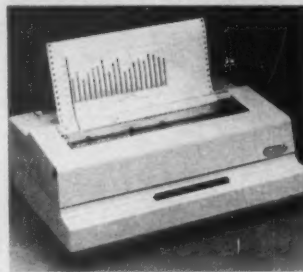
NORCROSS, Ga. — Printacolor Corp. has unveiled an intelligent color graphics printer terminal with an auxiliary computer enclosed within it.

The Printacolor IS8001 consists of a three-color ink-jet print head capable of giving graphics output. The internal computer enables it to interface with the host computer and limits dependency on the host, the vendor claimed.

The terminal has a 14-7/8-in. paper system with 70-char. capability and the printing head has 12 ink nozzles which print any of seven colors, by the overlay of three color inks.

Each of the three ink color jets has four nozzles.

The price for the product is \$6,000, the vendor said from 5965 Peachtree Corners E., Norcross, Ga. 30071.



The Printacolor IS8001

## Paperless Device Produces Braille From Cassettes

STUART, Fla. — A paperless device which reportedly produces braille from magnetic cassettes, computers and other information sources is available from Triformation Systems, Inc.

The Digicassette can be used as a notebook, audio recorder, calculator and word processor, the vendor said. It is equipped with high-speed search that permits the operator to call back lines of braille.

The seven-key keyboard includes six braille keys and one space key and is used to write braille. The heart of the system is the braille display with 20 braille char./line, each made of six dots which protrude silently.

The shape and size of the characters are identical to those of braille books. The price for the device is \$4,350, the vendor said from 3132 S.E. Jay St., Stuart, Fla. 33494.

## Career Courses Set for Fall

NORRISTOWN, Pa. — A career development program for executives, managers and information processing professionals was announced by William Maxwell, president of Maxwell Institute, Inc. Designed to provide advanced educational training with a minimum of time and expense, the course runs for six three-hour evening sessions.

The Delaware Valley-based training center also offers courses on data base concepts, management of application development, selection and implementation of a business minicomputer system, legal contracting with hardware companies, development of a DP auditing function and computer system fundamentals.

The cost of the Maxwell programs is \$150 each. Further information can be obtained by contacting Bill Valinote at Maxwell Institute, 2860 DeKalb Pike, Northtowne Plaza Shopping Center, Norristown, Pa. 19401.

## Federal Meet Features Ex-U.S. Navy Admiral

WASHINGTON, D.C. — Former U.S. Navy Rear Admiral Rowland Freeman III, administrator of the General Services Administration, will be the featured speaker at the Federal Computer Conference here on Sept. 22-24.

The conference was designed to help Federal Government ADP managers solve their productivity problems and give them an in-depth understanding of recent advances in information processing.

Oriented specifically toward ADP's role in making the Federal Government more efficient and accountable, the conference is expected to attract more than 9,000 attendees.

More than 80 speakers from both public and private sectors will take part. The latest in computers, peripherals, accessories, software and services will be on display.

Additional information is available from the Federal Computer Conference, P.O. Box 368, Wayland, Mass. 01778.



## You don't have to commit 'til we've lived together 90 days.

Only GTC promises so much. The industry's first 90 day guarantee. It means you can tie the knot with any GTC display terminal, and if you don't experience perfect bliss during the first three months of your working relationship, you can call the whole thing off. We'll take the terminals back. You'll get your money back.

All we ask is that you treat our terminals with respect, honor our standard purchase agreement terms, and take responsibility for freight charges.

But obviously we aren't worried about unrequited love. We wouldn't commit to the best guarantee in the business if we couldn't put you together with the best terminals in the business, from our teletype-compatible models to our interface-compatible models.

And to make our togetherness even cozier, we've coupled our 90 day guarantee to our standard 6-month warranty. Nobody can offer you a bond as strong as that, for love or money.

So take us on for 90 days. We may have the first honeymoon that never ends.

**General Terminal Corporation**  
The right button to push.™



For more information on GTC products and services, call toll-free today. In California: 800-432-7006. Anywhere else in the United States: 800-854-6781. Ask for Mary Hart. Or write Mary Hart at General Terminal Corporation, 14831 Franklin Avenue, Tustin, CA 92680. Telex: 910-595-2428. We have offices throughout the world. In Canada, contact Lanpar Ltd., 85 Torbay Road, Markham, Ontario, L3R 1G7. Phone: 416-495-9123. For a free reprint of this ad please write the GTC marketing department.





**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

*postage will be paid by*

CIRCULATION DEPARTMENT



**COMPUTERWORLD**

**375 Cochituate Road, Rte. 30  
Framingham, MA 01701**

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



Detach here, moisten and seal envelope securely before mailing.

**Fold and insert order form (attached through binding) and remittance here.**

## Offerings Based On DEC Hardware

### • LSI-11/23-Based System Takes Floppy, Hard Disks

MOUNTAIN VIEW, Calif. — Scientific Micro Systems, Inc. has introduced a system compatible with the Digital Equipment Corp. LSI-11/23 that supports both floppy disk storage and Winchester disk technology.

The Disk System 11X features an LSI-11/23 MPU, 128K bytes of random-access memory, four RS-232C serial ports and up to 2M bytes of floppy disk storage in a single enclosure. Storage can be expanded by adding a 26.4M-byte Winchester drive.

The 11X system is compatible with standard DEC RT-11 and RSX-11M operating systems. The addition of dual-head floppies reportedly doubles the storage normally available when running the RT-11 operating system offered on DEC's RX02 floppy diskettes. The device is also said to have a 40% faster disk access compared to DEC's single-head floppy drives.

#### Two Modes

The disk system contains a proprietary controller to interface between the LSI-11 Q-Bus and both floppy and Winchester-type drives. Two modes of operation are

(Continued on Page 68)

### • PDP-11/23 Offering Features RSTS/E, QDMS

HARTFORD, Conn. — Two Digital Equipment Corp. PDP-11/23 configured systems which feature RSTS/E time-sharing software and include the QDMS Data Management System have been introduced by Quodata Corp.

Composed exclusively of DEC hardware, the Q610 and Q620 also feature local DEC field service maintenance contracts.

Aimed at smaller users or a department within a larger company needing a time-sharing system, the basic configuration consists of DEC's PDP-11/23 CPU, 192K bytes of MOS memory, a four port multiplexer and two removable disk drives all mounted in a 40-in. high cabinet. In addition each system includes a VT100 CRT terminal, the RSTS/E operating system with Basic-plus, QDMS Data Management System and complete installation by DEC.

The RSTS/E supports concurrent, interactive and batch processing, Basic-plus, Basic-plus II, Cobol, Fortran, Pascal, APL, RPG-II, PL/I and assembler languages. It can run on PDP-11/34, 11/44, 11/60 and 11/70 computers with as many as 63 independent user jobs and connections to 127 terminals.

With the QDMS Data Management System, users can build data files quickly and

(Continued on Page 68)



Gene Walker (left) discusses screen output with Bob Gensamer at VS console in DP department. Systems will be in operation 24 hours per day, seven days a week.

## Mini Has Hand Behind Scenes At Hotel Casino

Special to CW

ATLANTIC CITY, N.J. — While the roulette wheels, blackjack and crap tables are not computerized, a computer is playing a very big behind-the-scenes part here at Resorts International, Inc.'s newest gambling casino.

Since last year, the casino has been using a Wang Laboratories, Inc. VS minicomputer to track payroll for more than 5,000 people, monitor the number of hours each person spends on the casino floor and keep a running tab on each person's skills and job-related abilities. The minicomputer operates with Wang's Human Resource Management System (HRMS) software which is geared to monitor each facet of the casino's business from an individual worker standpoint.

"At the present time, we have input 42 different earnings types to our system," George E. Croop, director of Resorts International's financial accounting, said. "In addition, many members of our staff work at more than one job. For example, in the casino there are a variety of gaming tables."

#### Labor Monitored

Labor-hour tracking requirements are unique in a gambling casino and must be accurately monitored, especially from the viewpoint of the Casino Control Commission that monitors all of the on-floor activities at the establishment. Resorts International's Atlantic City casino currently has about 400 day dealers, 400 swing-shift dealers and a variety of pit bosses, floor peo-



"Instead of posting job openings on a bulletin board, department heads will be able to access this information on-line at a workstation," George Croop stated. "At the touch of a button, VS/HRMS will generate a complete listing of employees with the required skills for available positions."

ple and box managers.

Like hours flown by airline pilots, accrued time worked by dealers at specific games can be as important as a college degree, according to Robert L. Gensamer, assistant controller at the organization's North Miami, Fla., office.

"In order to be promoted, each [dealer] must have a minimum number of hours at a particular game or multigame experience," he explained. "When a dealer decides to leave our hotel — which we hope won't hap-

(Continued on Page 70)

# TWINTWORLD

## THE RIGHT COUPON TO CLIP TO CUT YOUR TERMINAL BUDGET.

Our GT-100 Series of data display terminals is like an automatic savings plan. Because as your terminal needs change, our full-range GT-100 Series, the GT-100A, GT-100E, GT-101 and GT-110, can change right along with them. Each model is factory-upgradeable to any other model in the series. So you pay only for more terminal capability, not another terminal. Which means you save with our low-cost GT-100 Series at the start, and at every step along the way.

For more information, send this coupon to GTC, 14831 Franklin Avenue, Tustin, CA 92680. Or call toll-free. In California: 800-432-7006. Elsewhere in the U.S.: 800-854-6781. Ask for Susan Hart. In Canada, contact Lanpar Limited, 85 Torbay Road, Markham, Ontario, L3R 1G7. 416-495-9123.

**The right button to push.**  
General Terminal Corporation



Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_



## Three Cities to Host Small Computer Show

ARLINGTON, Va. — Small business computers, software and office automation will be the focus of a four-day conference and exposition scheduled to take place this fall in three different cities.

Sponsored by The Information Exchange, the Mid-Atlantic Computer Show will be held in Washington, D.C., Sept. 18-21, in Chicago Oct. 16-19 and in Boston Nov. 20-23.

The event will be comprised of a series of lectures dealing with a variety of small business computing aspects. Featured speakers include Lewis Kornfeld, president of Radio Shack; John Davenport, president of Software Development Corp.; and S.R. Senkus, a program administrator with IBM.

Session topics will be aimed at the issues affecting the use of computers in a small business, business software, the advantages of automation, implementation and hardware and software trends, a spokesman stated. The keynote address, delivered by Radio Shack's Kornfeld, will deal with the importance and necessity of computers to the small business venture.

The entire event is geared for small business operating executives, managers of small DP departments and small computer users seeking to expand their current capacities. Fees for the full conference and exposition program are \$245. However, special single-day rates for the first two days of the show are \$145 per day.

Additional information on the show or registration forms can be obtained from The Information Exchange, Suite 400, 1730 N. Lynn St., Arlington, Va. 22209.

## Z80-Controlled System Hikes HP Mini Print Speed

MENLO PARK, Calif. — A microprocessor - controlled printer system that reportedly gives users of the Hewlett-Packard Co. 300/3000 Series 30/33 minicomputers printing speeds up to 1,800 line/min has been announced by BDS Computer Corp.

Allowing a system more than four times faster than the 400 line/min printer supplied by HP, the HPI-33 controller includes a Z80 microprocessor, an Intel Corp. 8291 talker/listener for interfacing with the general-purpose interface bus (GPB) and associated memory and logic circuits.

The HPI-33 program includes program control mode,

transfer mode and test mode operation. BDS supplies seven line printers.

Band printers range from 300- to 600 line/min; drum printers have 300-, 600-, 800- and 1,800 line/min speeds, and the Charaband printer

runs at 1,250 line/min.

The HPI-33 costs \$2,500, with printers ranging from \$8,200 to \$31,500, depending on speed and print technology. BDS is located at 1120 Crane St., Menlo Park, Calif. 94025.

## Turnkey Aids Clothiers

WAYNE, Pa. — A turnkey minicomputer system for apparel manufacturers is available from Ketron, Inc.

The Apparel Management Support System includes a Qantel Corp. 220 minicomputer, a 12M-byte disk drive and a CRT terminal. It gives apparel manufacturers a fully

automated cut size allocation system, a finished goods order allocation system and an automated pick slip generator, the firm said.

The system costs about \$50,000 from the firm at the Valley Forge Executive Mall, 530 E. Swedesford Road, Wayne, Pa. 19087.

## Floppy, Winchester Disks Backed

(Continued from Page 67) possible, a spokesman noted.

The compatible mode provides complete DEC RX02 hardware, software and media compatibility. Standard DEC software will run on the 11X without any modifications to the device handlers. To access the Winchester disk and IBM-compatible floppy disks, the controller's extended mode can be utilized with an appropriate device handler.

The extended mode also increases system throughput. Rather than transferring only one disk sector per command, up to 65K-byte data blocks can be transferred in a single

command.

Additional features of the system include test and diagnostic support, a menu-driven display and a diskette-based automatic boot for stand-alone programs.

Finally, either 13.2M or 26.4M bytes of formatted Winchester disk storage may be added to any disk system via a plug-in cable. Included with each 11X system are four rear-panel-mounted RS-232C

connectors and an eight-slot backplane for additional power or customer-furnished LSI-11 modules.

Prices for the 11X with an LSI-11/2 start at \$7,400 and \$9,995 for the system with the LSI-11/23. Add-on Winchester storage prices begin at \$3,800. Quantity discounts are also available from the company at 777 E. Middlefield Road, Mountain View, Calif. 94043.

## IBM System 34 to System 38 Conversion Aids

### For Sale

We have developed a number of comprehensive programs that can save you time and money in converting from an IBM System 34 to a System 38.

Conversion kit contains programs for:

- RPGII Conversion
- Message Number Conversion
- Screen Conversion
- Data Base Techniques Interface/Expansion
- and others

Call or write for more information.



P.O. Box 90/Idaho Falls, Idaho 83401/(208) 523-6600

## System Based On PDP-11

(Continued from Page 67) obtain reports from several files simultaneously.

The Q610 comes with two RL01 disks for 10M bytes of total on-line storage and costs \$33,100. A Q620 includes two RL02 disks with 20M bytes on-line and costs \$36,900.

Inquiries may be addressed to Myron Congdon, Quodata Corp., 196 Trumbull St., Hartford, Conn. 06103.

## The Pascal Software Tool

OMSI PASCAL V1.2®

The value of Pascal in computer software design is becoming widely recognized. And our new V1.2 version contains significant enhancements in ease of operation and reliability. Consider the V1.2 Symbolic Debugger.

Pascal debugging should be performed in Pascal, not with assembler listings and memory maps. Our Debugger knows your data names and structures. Values are accepted and displayed in Pascal notation, including scalars, sets, arrays, records, and pointers.

Complete interactive control displays your original source lines, including embedded comments. Breakpoints give statement numbers and procedure names, rather than octal addresses. The Debugger can show the program execution history, including all stacked procedure calls. Should fatal errors occur, they are intercepted by the Debugger instead of ending your testing.

For more information on our approach, ask for the complete OMIS Pascal V1.2 Product Description.

## Oregon Software

2340 S.W. Canyon Road • Portland, Oregon 97201  
(503) 228-7780 • TWX 910-484-4779

### INTERNATIONAL DISTRIBUTORS

Australia: Sydney  
Network Computer Services 211-2322  
Canada: Vancouver  
Valley Software (604) 291-0551  
England: London  
Real Time Products 01-588-0607

Japan: Tokyo  
Rikai Corporation 03-345-1411  
W. Germany: Aachen  
A.C. Copy 241/50-60-98  
W. Germany: Munich  
PCS 089/68-10-21

## AMERICA'S LARGEST DATA ENTRY SERVICE

QUALITY DATA  
AT COMPETITIVE PRICES  
OVER 1000 DATA ENTRY  
OPERATORS

CALL TOLL FREE 800-345-6324  
(IN PENNA. CALL 215-825-9080)



Two Plymouth Commons, Plymouth Meeting, PA 19462

ATLANTA • DETROIT • KANSAS CITY • LOS ANGELES • MINNEAPOLIS • PHILADELPHIA • SPRING LAKE (NJ)

# The AS/5000. Not even IBM can offer this much for this little.

It has been a popular misconception in the computer industry that no one is able to offer the kind of price, performance, and support that IBM can.

We'd like to clarify matters.

Our AS/5000 computer is a medium-scale, IBM-compatible system that offers as much as 15% better performance than an IBM 3031, at a substantially lower cost. It forms the middle of our Advanced Systems (AS) product line, the broadest range of IBM-compatible computers available today.

The AS/5000 is a two-megabyte, six-channel system, optionally expandable to eight megabytes. Through the use of advanced integrated circuit technology, the number of components, pins, and connections is substantially less than used by IBM—resulting in unsurpassed reliability. The AS/5000 is lighter, takes up less floor space, requires 50% less power, and generates about half as much heat as comparable IBM systems.

## A truly flexible system, with tailored support.

The AS/5000 supports all IBM System/370 and 303X operating systems, including their extensions. The AS/5000 runs complete VM-ECPS, including EVMA, more than is offered on the IBM 3031.

In addition, we offer new, more flexible software support services. Choose between Central Program Support Services or Local Program Support Services, and get software support tailored to your specific needs.

Another important feature of the AS/5000 is its advanced microcode architecture. Through microcoding, language functions become a part of the machine itself, rather than an element of the software. This feature allows performance enhancements such as MVS/SE and VM-ECPS to be implemented, and allows the AS/5000 to remain compatible with any additional enhancements to existing

IBM systems. We provide what you really need—on-going compatibility to protect your sizeable investments in systems, software and training.

That's one reason why we're called the Compatible Computer Company.

## More computer for your money. Now.

The AS/5000 is manufactured at our Southern California facility and is available now. You can receive shipment of your computer when you want it—and need it.


Our commitment to deliver superior performance and reliability at a lower cost extends beyond the design and development of our equipment. We back the AS/5000 with the finest support in the industry, including a world-wide network of expert Field Engineers and Software System Support Representatives. We offer total support capabilities to help protect your computer investment. Now and in the future.

We also offer versatile financing alternatives, including several highly competitive long-term or short-term leasing programs.

If the AS/5000 sounds like what you've been looking for, contact your local National Advanced Systems sales office, or write to Marketing Dept. A1, 3145 Porter Drive, Palo Alto, CA 94304, 415/856-5000. We'll be happy to send you all the information you need.

The AS/5000 from National Advanced Systems.

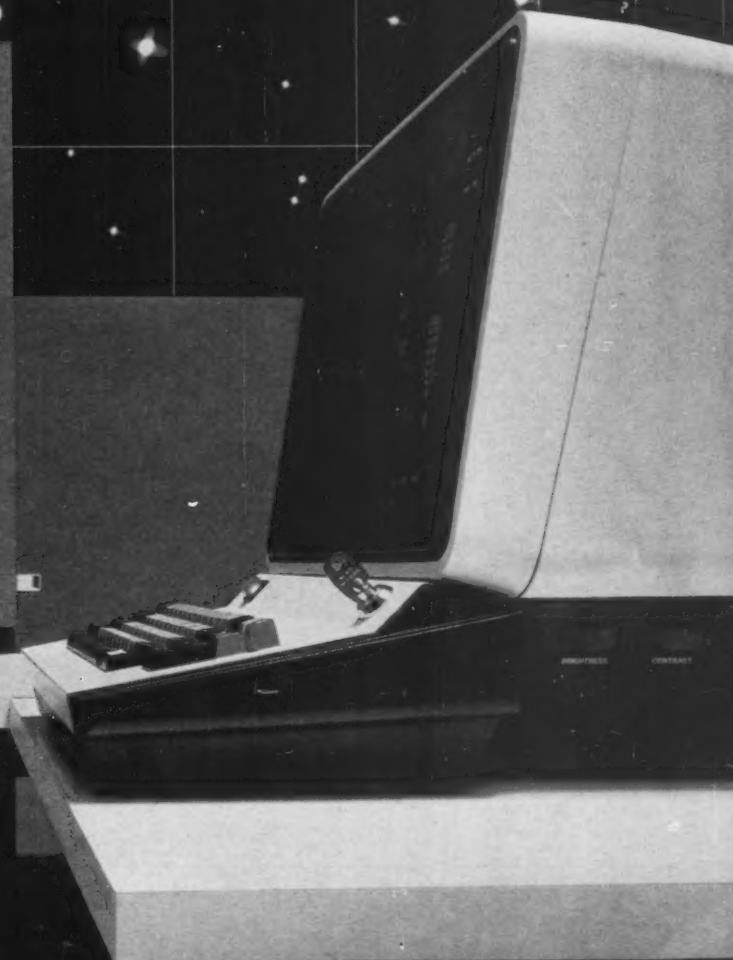
If IBM built theirs like ours, we'd have some serious competition.

 **National  
Advanced Systems**

**The Compatible Computer Company**  
A subsidiary of National Semiconductor

 **National  
Advanced Systems**

**AS/5000**



# Mini Plays Behind Scenes at Resort Casino

(Continued from Page 67)  
pen — we must supply the new employer with a notarized record of hours worked ... an extremely important function in the licensing and promotion process."

## Skills Bank

One of the more integral parts of the VS/HRMS is a skills bank that keeps a continually updated inventory of each staff member's training, education and experience. Information from this bank can be retrieved immediately as a need arises. For instance, if the organization were searching internally for a technician who has had some training in computers, the HRMS would pinpoint those with degrees or academic experience.

Keeping an up-to-date file on employees is necessary because the Casino Control Commission maintains that a casino must try to promote from in-house before going to outside sources.

Also, "before an individual can start on the casino floor, he or she must be cleared by the commission," Gensamer continued. "It is important that we maintain follow-up on these licenses and their renewals, as well as in the work permits of all employees."

Like any business-oriented system, the VS handles payroll for the 5,000 people currently on hotel/casino's staff and will be able to accommodate the 7,000 more people expected to be hired within the next two-and-a-half years. Presently, 23 different payroll deductions reside on the VS and the system can print some 10 different types of earnings on an employee's check. The computer has also reduced the amount of paper floating around Resort International's management by about 90%.

## Other Applications

Other potential financial applications include general ledger, accounts payable and job costing, Gensamer said. By-products of the system include a car-pooling system for matching riders, drivers and

shifts and a VS word processing option that will be used in credit collection and casino control regulation violation reporting.

At the moment, the Wang VS computer has two 288M-byte disk drives, a tape drive, a 600 line/min printer and six CRT workstations. Three terminals are located in the Payroll Department, and one is situated in each of the casino personnel, development and DP de-

partments. Cobol, RPG-II and Basic are being used from the VS language repertoire. But hardware and software expansion is definitely in the cards.

For instance, having workstations directly on the casino floor is one possible avenue of expanding the system.

"We presently track, manually, about 22,000 different numeric forms per day," Gensamer noted. "Although you

can't computerize the games, there is a certain amount of paper going through the games over which you must maintain numeric control."

## Possible Advantages

At some point in the future, there could be some advantages to having a computer-link right in the gambling pit, he pointed out. For instance, "they could be used to process credit verification — for peo-

ple who gamble on credit or with customer checks — for the 22,000 credit files we maintain."

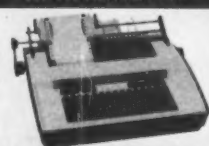
But, before bringing computers to the roulette and blackjack tables, there are many other applications for system expansion that may occur first. Resorts International is a multicompany organization comprised of more than 25 firms in the U.S. and in the Bahama Islands.



**DECwriter IV Model AA.**  
The new forms-handling terminal that doesn't limit your choice.

## TRACTOR FEED

For The Model 43 TTY



AT LAST... an adjustable TRACTOR FEED add-on for the MODEL 43 TTY. Now you can use standard form sizes and labels. Attaches in minutes with four screws. Comes complete for only \$89.95 (MC, VISA, COD accepted) NY residents add tax.

## MICRO WORLD

MICRO WORLD COMPUTERS, Inc.

400 West Street, Ashburn City, N.Y. 12016

Dealer inquiries invited (800) 790-3000



## Floppy Loading Automated

SANTA ANA, Calif. — An automatic floppy disk loader designed for data certification, initialization, batch terminal data storage, error logging and program spooling from magnetic tape or disk has been unveiled by Media Systems Technology, Inc.

The Media Loader subsystem is software-driven and features a stacking capacity of up to 50 diskettes in any size and single- and double-density configurations.

Individual diskettes are fed through an input hopper and then accepted or rejected into respective output hoppers after completion of a read or write function, a spokes-

man said. In addition, the device contains a halt-on-reject feature which is said to enable an operator to stop the automatic sequencing of diskettes with the last diskette in the output hopper. Up to eight loaders can be used by a single operator in a system.

The Model 1005 media loader, for 8-in. diskettes, costs \$4,075 for the single-sided version and \$5,370 for the double-sided model. The 050W loader, for 5.25-in. floppies, costs \$4,675 for the single-sided and \$4,875 for the double-sided version.

Media Systems Technology is located at 1616 S. Lyon, Santa Ana, Calif. 92705.

## McAuto Hospital System Based on Microdata Gear

ST. LOUIS — McDonnell Douglas Automation Co. (McAuto) has announced a minicomputer-based financial information system which it claimed was designed to eliminate the risks often associated with hospital establishment of in-house computer operations.

The Mini-Based Hospital System (MHS) combines computer equipment manufac-

tured by Microdata Corp., a subsidiary of the McDonnell Douglas Corp., and software developed for hospitals.

"With MHS, it is not necessary for the hospital to hire computer specialists," a McAuto spokesman said. "Interactive system prompting and step-by-step instructions enable existing hospital personnel to quickly learn the procedures for the Microdata computer equipment used by MHS."

The approximate costs of MHS should range from \$4,000/mo to \$15,000/mo, depending on hospital size, volumes and options selected. McAuto can be reached at P.O. Box 516, St. Louis, Mo. 61366.

You probably know the DECwriter IV for its flexibility in handling paper.

Well, now you can have that same flexibility in handling forms.

The new DECwriter IV Model AA with its snap-in tractor feed option can automatically handle both standard and custom forms. Forms as wide as 14 1/2". And as narrow as 3". In up to four parts.

And you can control this new terminal either directly from its keyboard or from a computer.

With the DECwriter IV Model AA you can condense characters down to 16 1/2 per inch. Or expand them up to 5 per inch. On a field of 132 horizontal and 84 vertical tabs. And a simple setting also lets you super-condense lines down to 12 per inch. So you get more information per line, per form.

You can also be sure of synchronized printing from one form to the next, no matter what form you're using. Because with the DECwriter IV Model AA you program "top of form." And parity is easily selected at the keyboard, simplifying communication with other computers.

Simply remove the tractor feed option and the DECwriter accepts all your roll feed or sheet paper up to a width of 14 1/2".

Of course the new DECwriter IV gives you switch-selectable 110 and 300

baud rates. And a 45 CPS catch up rate so you get the true 30 CPS throughput found on our original DECwriter IV Model DA. You also get the extra attention to features you expect from Digital. Like foreign character printing, super/sub-script capabilities,



ties, keyboard-selectable local echo, and a print head that moves aside when desired so you can see the last character printed.

Best of all, Digital has put all this capability into a terminal that fits right into a wide range of environments—either on its custom stand or on a desktop. And the DECwriter IV's solid-state components and microprocessor controls continue to build on the reliability standards set by the DECwriter II. All at a surprisingly low price.

The DECwriter IV Model AA. For real forms-handling capability, it's your only choice.

To order your DECwriter IV Model AA, or the original DECwriter IV Model DA, call your terminals supplier or write Digital Equipment Corporation, Terminals Product Group, MR2-2/M67, One Iron Way, Marlboro, MA 01752. In Europe: 12 av. des Morgines, 1213 Petit-Lancy/Geneva. In Canada: Digital Equipment Corporation of Canada, Ltd.

**digital**

## Controllers Use 6800s

NASHUA, N.H. — Functional Automation/Gould, Inc. is offering a line of programmable controllers that can be used to link multiple minicomputers in distributed networks or energy management systems.

Cyblok consists of two 6800 microprocessors. One handles applications processing while the other handles I/O processing, the vendor said.

Each unit in a Cyblok is a control point capable of operating independently or with other CPUs in its own or other Cybloks. The unit's data base is partitioned so there is no specific file location, a spokesman added.

Cybloks cost around \$20,000 each, the vendor said from 3 Graham Drive, Nashua, N.H. 03060.

## Power Unit Bows

PLAINVIEW, N.Y. — The Voltector Series 5 ac power conditioners from Pilgrim Electric Co. remove electrical disturbances from the power line to protect minicomputers and microcomputers, according to the vendor.

The Voltectors come in models ranging from 1A to 20A and range in price from \$148 to \$393.

Pilgrim Electric is at 29 Cain Drive, Plainview, N.Y. 11803.

Think you need a Systems Programmer for your DOS/VS or DOS/VSE environment?

Think again! All you'll ever need is GENESYS, the professional systems engineering service.

**GENESYS**  
Systems Engineering  
Services  
30 Church St.  
Sudbury, MA 01776  
Tele. 517/443-9224

# IT<sup>TM</sup> is the difference between too smart and too dumb.

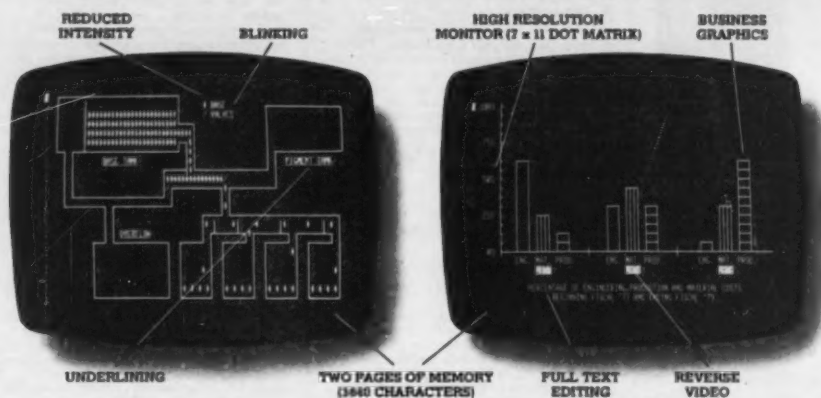


Just when you thought you were totally confused by the incredible variety of "smart" computer terminals on the market, Lear Siegler brings you exactly what you need. It is IT, the Intermediate Terminal™ video display.

IT banishes all the confusing claims being made in the computer marketplace by compressing the broad spectrum of "smart"

could go on all afternoon. Outstanding among them are the two pages of display that are standard with IT. Use them both and get up to 3840 characters of display potential. Or, allocate the second as a print buffer and be sending data on page two while entering data on page one.

Each page has the following independent page characteristics:



terminals into ITself. Now, when you're looking for a terminal that isn't too smart but isn't too dumb either, IT is perfect for the job. And instead of having to weave your way through the confusing forest of "smart" terminals, just look for IT. Because IT is enough.

IT brings you the same high standards and solid workmanship that made its cousin, the Dumb Terminal® video display, a legend in its own time. IT may be of average intelligence, but there's nothing average about IT's consistent, quality performance and sensible features.

IT is completely self-contained, with full editing, formatting and protected field capabilities. Not to mention a microprocessor which increases reliability and ease of use.

### **TWO PAGES ARE BETTER THAN ONE.**

The list of IT's special features

protect, program mode and cursor retention. And when you change from one page to another, these characteristics are stored in memory to be recalled at another time, letter perfect.

### **IT HAS QUITE A DISPLAY.**

With IT, specific areas are designated as protected fields. They can't be typed over unless you remove the terminal from the protected mode. Even your remote computer can't overwrite the protected fields until IT is removed from the protected mode. Background (protected data) can be displayed at a lower intensity, while foreground is displayed at normal intensity and may be modified. You can even tab the cursor forward and backward to the start of each unprotected field.

And when you depress IT's special function key, a special function sequence is transmitted.

The remote computer is then in full control. And all control functions that can be initiated from the keyboard can also be executed from the remote computer.

Also on IT, full or half duplex operation is switch and keyboard selectable. You can also choose from conversation or block transmission, which can be initiated by you or the computer. In block mode, a line, a message or a page can be transmitted in its entirety.

### **IT IS NOT JUST ANOTHER PRETTY FACE.**

IT's editing capabilities allow you to clear the screen, or use the cursor for a character change. In addition, IT comes complete with character insert and delete, line insert and delete, erase to end of line/field/screen, and tab and back tab. IT's full controls also allow you to skip protected fields, backspace, forespace, move up, down, return, home, and new line.

And when it comes to behavior modification, IT has few peers. Because IT comes with a factory installed personality for selected parameters. Such as an alternate ESCape sequence lead-in, in addition to the standard ESCape. A different End Block character. A different New Line character sequence. A different field separator. And a function sequence preamble.

### **FIND OUT THE WHOLE STORY ABOUT IT.**

The people at Lear Siegler would be more than happy to fill you in on all the details about IT. Just drop us a line or call. Because IT is worth it.



**LEAR SIEGLER, INC.**  
DATA PRODUCTS DIVISION

## **IT, the Intermediate Terminal from Lear Siegler.**

Lear Siegler, Inc./Data Products Division, 714 North Brookhurst Street, Anaheim, CA 92803 800/854-3805. In California 714/774-1010. TWX: 910-591-1157. Telex: 65-5444. Regional Sales Offices: • San Francisco 408/263-0506 • Los Angeles 213/454-9941 • Chicago 312/279-5250 • Houston 713/780-2585 • Philadelphia 215/245-1520 • New York 212/594-6762 • Boston 617/423-1510 • Washington, D.C. 301/459-1826 • England (04867) 80666.





## Getting the Most From Trade Show Dollars?

By Jeffry Beeler

CW West Coast Bureau

IRVINE, Calif. — True or false: One of the surest ways to win new customers and develop sales leads during trade shows is to stock your company's exhibit booth fully with product literature and keep the material in plain sight at all times.

True or false: a trade show exhibitor can attract a greater than usual number of qualified customers and thus increase its sales opportunities by opening a conveniently located hospitality suite and inviting all interested visitors to come by for

free snacks and drinks.

If you answered "false" to both of the above questions, go immediately to the head of the class; you're absolutely right.

But if you answered "true" and if you have a hand in planning your company's trade show participation, chances are good your firm is wasting at least some of its resources at major industry gatherings like the National Computer Conference.

### Matchless Opportunities

Trade shows provide high-technology companies a nearly matchless opportunity to showcase seldom-displayed prod-

ucts, generate new sales leads, make friends with members of the press and corral large numbers of otherwise inaccessible new customers.

Yet at the same time, the cost of renting booth space and of trade show participation in general has soared to dizzying heights.

So failure to make the most of their trade show appearances can cost high-technology exhibitors dearly, both in squandered expenses and in lost business opportunities.

But exactly how can a company's effectiveness be improved?

(Continued on Page 80)

## By 1990, ADL Projects

# Communications Mart Seen Doubling

CAMBRIDGE, Mass. — The worldwide telecommunications equipment market will more than double by 1990, with Asia setting the pace, according to a two-year study by Arthur D. Little, Inc. (ADL).

Specifically, the world market is expected to grow from an estimated \$40 billion in 1980 to about \$87.5 billion (in constant 1979 dollars) by the end of the decade, at an annual rate averaging 8.5%.

With a projected growth rate "well above the world's average," according to ADL, the Asian region will grow from 1980's estimated market of \$10 billion to \$27 billion in 1990.

The Asian spurt will come chiefly from heavy capital investments planned by five countries — the USSR, Japan, Korea, China and Turkey — according to Edgar A. Grabhorn, senior ADL telecommunications expert, who directed the World Telecommunications Study II 1980-1990.

A 1970 ADL world telecommunications study, also directed by Grabhorn, accurately predicted the current worldwide \$40 billion market, according to the firm.

### Russian Market Studied

Included in the current four-volume report is the first English language in-depth survey of the Russian market, ADL claimed, which points out that the USSR currently accounts for one-third of the Asian telecommunications

equipment market.

The \$3.5 billion size of the USSR market is partly obscured by the fact that much of the equipment is obtained through barter with Eastern European countries, Grabhorn observed.

Somewhat behind U.S. developments in television via satellite, the USSR is following a similar pattern of installing hundreds of receive-only earth stations, primarily to service remote communities. On the other hand, there are about 20 million telephones in the USSR for an estimated population of 268 million

vs. 175 million telephones in the U.S. for a population of 224 million, the study found.

With about 30% of the world telecommunications equipment market by 1990, Asia is expected to have surpassed the European region and be second only to North America in size. In some cases, the country representing the largest market within a region will be displayed by another country in 1990, the study projected. For example, Russia is expected to replace Japan as the largest market in Asia.

The study breaks telecommuni-

cations equipment into six system categories: telephone; telegraph, telex and data communications; satellite communications; mobile radio and radiotelephone; radio paging; and CATV.

Grabhorn sees the proliferation of more sophisticated semiconductor devices, particularly large-scale integrated circuits, as one of the technological forces driving the continuing explosion of markets for telecommunications; mobile radio and radiotelephone, radio paging; and CATV.

(Continued on Page 82)

## Offer Valued at \$60 Million

# NCR Beats Mitel in Bid for Adds

HAUPPAGE, N.Y. — NCR Corp. and Applied Digital Data Systems, Inc. (Adds) have reached a tentative agreement by which NCR will acquire the CRT terminal manufacturer located here.

Adds' board of directors met to discuss the NCR offer Aug. 26 and announced their acceptance the following day, according to a spokeswoman there.

Under terms of the agreement, NCR will pay \$12 a share for the approximately 4.7 million Adds common shares. NCR will also pay \$27 a share for the company's 162,549 convertible preferred shares.

The NCR offer is valued at about \$60 million, some \$5 mil-

lion more than Mitel Corp., the only other bidder, offered.

No effective date for the trans-

action has been announced yet and Adds is awaiting a formal NCR offer.

## Bryce Verdict Reaffirmed

MILWAUKEE — An appeals court judge here has affirmed a jury verdict that Arthur Young & Co. misappropriated the trade secrets of M. Bryce & Associates, Inc. when preparing a DP standards manual for one of its clients.

The jury decision was first affirmed by a circuit court judge here [CW, April 28] before it was appealed by Arthur Young & Co. to the appellate court, where Judge Leander J. Foley reaffirmed it.

Bryce filed the original suit in 1974, charging that Arthur Young stole a proprietary methodology Bryce had developed for designing DP systems. The accounting firm learned about the methodology, packaged first in a manual and later automated and called Pride, during a presentation Bryce made to the Harley-Davidson Co., an Arthur Young client, according to Andrew Riteris, Bryce's attorney.

Riteris expects Arthur Young to appeal Foley's decision.

**WHY ORDER AN INTELLIGENT TERMINAL OR A SMALL SYSTEM YOU HAVE TO WAIT FOR?**

## CALL DDI—IT BEATS WAITING 2 WAYS!



Durango F-85

1. You get off-shelf delivery of Datapoint 1500, Datapoint 1800 or Durango F-85 ... each offering unique features and top ratings in price/performance.

DDI also makes available nationwide maintenance ... professional support from nearby branch offices ... a wide choice of peripherals and quantity discounts that build with each additional product you buy.

2. DDI's powerful, portable MicroCobol<sup>®</sup> software frees you from dependence on manufacturers ... enables you to switch to any of many intelligent terminals or small systems without reprogramming.

MicroCobol is the only program development tool you need. It gives you complete capability in data entry, communications and business applications.

For action, contact John Carman, National Sales Mgr.—Systems, 50 Washington St., Norwalk, CT 06854. Tel: (203) 853-2290.

**Data Dimensions, Inc.**

## The New Standard For PDP-11 Disk System Technology RM03 RM05 RM07



**Only System Designed Just for PDP-11 Family**  
Designed exclusively for DEC's UNIBUS or MASSBUS CPU's. On the UNIBUS, it's just one card that plugs into any spare SPC slot. On the MASSBUS, four cards plug into any spare existing RH70 standard back plane.

**Same Disk Drive as DEC RM02-03, RP06 and RM04-05**  
We use the same disk manufacturers as does DEC. The RM02-03 is the 9762 CDC 80MB and the new RM04-05 300MB is the CDC 9766. Only the LOGO is different.

**Transparent to All DEC Software, Diagnostics and Drivers**  
You bet! Use your existing Software... no change needed. Runs all DEC's Diagnostics plus has its own. Fully emulates DEC disk Drivers.

**Worldwide Installation and Maintenance**  
Through Data Systems Services, maintenance and installation is provided via CDC for both Drive and Controller. We also offer full PDP-11 system support.

**Full Media Compatible?**  
That's right! You can read or write on our drives. Put it on DEC's and it will play or vice versa. TRULY MEDIA COMPATIBLE.

### Compare These Prices

|          |                    |          |
|----------|--------------------|----------|
| DRM02-3  | 80MB Slave         | \$ 8,995 |
| DRJM02   | 80MB + Controller  | \$15,995 |
| DRWM03   | 80MB + Controller  | \$17,995 |
| DRJM04-5 | 300MB Slave        | \$16,995 |
| DRJM04   | 300MB + Controller | \$23,995 |
| DRWM05   | 300MB + Controller | \$25,995 |
| RJM07    | 600MB + Controller | \$32,995 |
| RWM07    | 600MB + Controller | \$34,995 |
| RM07     | 600MB Slave        | \$24,995 |

OEM Discounts Available

**(714) 770-8024**

22642 Lambert, Suite 408  
El Toro, CA 92630

**DATA  
SYSTEMS  
SERVICES**

PDP and DEC are registered trademarks of Digital Equipment Corporation.

## Hughes Aircraft Co. Gets AT&T Satellite Contract

WASHINGTON, D.C. — AT&T has awarded a \$137 million contract to Hughes Aircraft Co. covering construction of three communications satellites. Each will have a capacity of 21,600 simultaneous telephone conversations or 24 TV programs.

The satellites will be used for long-distance toll and Wats services and for any other authorized service "where the characteristics of satellite transmission might best satisfy customers' special needs," the phone company said.

The first of the Telstar 3 satellites will be launched in 1983, the second the following year and the third in 1985 or 1986. They will replace the three Comstar satellites which AT&T, together with GTE Satellite Corp., now leases from Comsat General Corp.

Pergamon International Corp. has concluded a 10-year agreement with the USSR for the compilation and exclusive distribution of modern English language abstract services and on-line data bases in science, technology and engineering. Under the agreement, Pergamon will utilize the extensive resources of Viniti — the world's largest abstracting service covering all fields of science, technology and engineering — to create jointly new abstract and computerized data base information services.

### Other Awards

Lambda Biosystems, Inc. of Englewood, Colo., has been awarded a contract to place a multiuser computer system in the laboratory of St. Joseph Mercy Hospital, Mason City, Iowa.

Digital Equipment Corp. has received a \$12.8 million contract from the National Institutes of Health for multi-processor mainframe computer systems and peripherals.

The Corporation for Applied Systems, Bethesda, Md., has been

awarded a two-year contract valued at almost \$1 million by the Veterans Administration to provide ADP Technical Support Services to the VA's Benefit Systems Support Service and its several nationwide data centers.

## Contracts

Tandon Magnetics Corp. has announced the signing of a multiyear agreement with Hewlett-Packard Co. for its TM-100 5.25-in. floppy disk drives for use in HP's computational products.

Softech, Inc. has been awarded a \$598,403 contract by the U.S. Air Force Avionics Laboratory at Wright-Patterson Air Force Base, Dayton, Ohio, to participate in the development of a High-Level Language Machine, an advanced avionics computer that can execute high-level language statements.

Codex Corp. has signed a contract with Utah State Information Systems Center for LSI 48FP/LSI 96FP modems and technical control facilities.

Great American Insurance Companies of Cincinnati has signed a contract to license Policy Management Systems' Series II family of systems.

Cullinane Corp., Wellesley, Mass., has contracted for the McCormack & Dodge financial software products and plans to convert them to run under the IDMS data base management system.

Integral Business Computing has signed a \$200,000 contract with Nordair Ltd., of Toronto for its Tours computerized reservation system.

## Nickels & Dimes

Amdahl Corp. has filed a registration statement with the Securities and Exchange Commission relating to the proposed public offering of 1,350,000 shares of common stock. The First Boston Corp. has been named manager of the underwriting syndicate.

In addition, Amdahl Corp. will sell 650,000 shares of its common stock to Fujitsu Ltd., a principal stockholder which presently owns 32% of the company's outstanding common stock.

\$\$\$

Timeplex, Inc. has filed a registration statement with the Securities and Exchange Commission relating to a public offering of 548,288 shares of its common stock, of which 500,000 shares are to be offered by the company and 48,288 shares are to be offered by several selling stockholders. The company anticipates the offering will be made in September. The proceeds from the sale will be used for capital expenditures and working capital.

\$\$\$

Modular Computer Systems, Inc. has

filed an application for the listing of its common stock on the New York Stock Exchange. The company anticipates that trading on the Exchange will begin on or about Sept. 17.

\$\$\$

Wang Laboratories, Inc. has filed a proposed offering of \$100 million convertible subordinated debentures due in 2005.

\$\$\$

Informatics Inc. has been advised by the Equitable Life Holding Corp. that the Holding management intends to recommend to its board of directors that Holding make a secondary public offering of the 1,267,250 shares (61%) of Informatics common stock that it owns.

\$\$\$

Harris Corp. has declared an 11% increase in the quarterly dividend to 20 cent/share from 18 cent/share, raising the annual rate to 80 cent/share compared with the previous 72 cent/share. First dividend at the higher rate will be payable Sept. 19 to shareholders of record Sept. 5.



# Does Your Company Produce Catalogs?

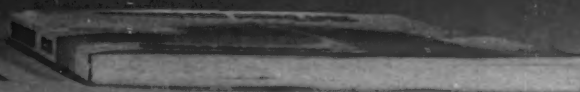
**We'll Cut The Size, Weight, Delivery Time and Cost!**

*Catalog Produced by Conventional  
Printer (the old way)*



**600 Page Catalog, Weight: 3 lbs.  
Delivery time: 2 to 3 Weeks**

*Same Catalog Published by  
O'Neil Data Systems*



**275 Page Catalog, Weight: 1 lb.  
Delivery Time: 4 Days**

**IF YOUR COMPANY PRODUCES PRICE CATALOGS**, inventory lists, parts manuals, schedules, internal telephone directories, library catalogs, reference and instruction material, membership or registration lists, we can save you substantial money and delivery time.

If you have large numbers of items in a computer you need to print and distribute on a recurring basis, **JUST SEND US A MAGNETIC TAPE AND WE'LL DO THE REST:**

- Innovative catalog redesign and data organization. Reduction of weight, space and number of pages. Format changes and error corrections. Automated printing and fast mailing to your distributors or mailing lists. In the example above, \$1.00 per book is saved alone on 1st Class Postage between Los Angeles and Chicago.
- Your product will look better and be easier to use. You'll save even more money because our shorter delivery time gets price changes to your dealers faster. (Time means Big Money during inflationary periods.)
- You will avoid delays and headaches related to internal priority and approval problems when you want to make changes to your catalog. Changes that require your computer staff to alter their programs. We have 12 Systems Programmers and make such changes in a few hours.

- O'Neil Data Systems has two large scale computers driving Advanced Computer Output Microfilm and Phototypesetting equipment plus our own automated printing facility; all on the premises. We don't ship out or subcontract any phase of your job. This means we do your job faster and at less cost to you.

## • WHOSE CATALOGS DO WE PUBLISH?

|                                 |                                       |
|---------------------------------|---------------------------------------|
| Beckman Instruments, Inc.       | Pacific Telephone and Telegraph       |
| BMW Motor Co. North America     | Peterbilt Motors Company              |
| Burroughs Corporation           | Real Estate Digest                    |
| Century 21 Real Estate          | San Diego Unified Schools             |
| Computer Sciences Corporation   | The Service Bureau Co. (Control Data) |
| Walt Disney Productions         | Telecredit, Inc.                      |
| Fiat Motors of North America    | Toyota Motor Sales, U.S.A., Inc.      |
| Foremost McKesson, Inc.         | United Stationers                     |
| General Dynamics, Convair Div.  | University of California              |
| American Honda Motors Co., Inc. | U.S. Suzuki Motor Corporation         |
| Kahan & Lessin Co.              | Volkswagen-Porsche-Audi               |
| Kawasaki Motors Corp., U.S.A.   | Volvo of America Corporation          |
| Department of the Navy          | Yamaha Parts Distributors, Inc.       |

## WHY NOT LET US BID ON YOUR NEXT PRINTING CONTRACT?

Tell me more about saving money and time with your  
**Faster 4-Day Service.**

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Phone \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_

## O'NEIL DATA SYSTEMS, INC.

2005 Armacost Avenue • Los Angeles, California 90025 • Telephone: 1/213/879-0830

**JUST SEND US A MAGNETIC TAPE — WE DO THE REST!**

# **38 delivers**

**The productivity advances of IBM's  
new System/38 are being  
confirmed in early installations.**

IBM has started delivering System/38's to customers.

And customers have started delivering comments like these to IBM.

**"I created a special equipment report in 15 minutes flat. Before, it would have taken a day and a half of programming,"**

—Chuck Petter, Data Processing Manager, Road Machinery and Supplies Company, Minneapolis.

**"We've developed an online order entry system with one-third the effort... and the application is much more polished. We're very pleased."**

—Larry Brenner, Director, Corporate Information Services, United Merchants and Manufacturers, New York City.

**"The System/38 significantly reduced the amount of code necessary to write a program and the time and effort required to move into new applications. We're extremely enthusiastic."**

—Larry Petterson, Director of Data Processing, St. Olaf College, Northfield, Minnesota.

And we're enthusiastic, too.

Because the IBM General Systems Division's versatile new System/38 is a compact system with

many large computer features. Such as distributed online work stations so users don't have to go to the computer; a central data base that makes information easier to retrieve, revise and use; the Control Program Facility, which automatically monitors and manages the flow and processing of data; online program testing, so programs can now be debugged as normal processing continues.

And System/38 has advanced features rarely found in any computer, large or small. Like Single Level Storage, which treats all storage as a single unit and automatically keeps track of it.

And thanks to System/38's streamlined architecture, many functions that previously required programmers' time have been absorbed into the system itself.

The result of these IBM innovations? A computer that lets you do much more, much more simply.

We're pleased that System/38 is already helping business function with greater cost-efficiency, productivity and profitability.

In short, System/38 delivers. And it can deliver for you.

For more information call your IBM General Systems Division representative or write us at P.O. Box 2068, Atlanta, GA 30301.



**IBM**

General Systems Division



# Getting the Most From Your Trade Show Dollar?

(Continued from Page 75)  
tiveness at trade shows be improved to minimize its costs and maximize its payback? What obvious but often ignored sales techniques should an exhibitor be employing, and what common pitfalls should be avoided?

In hopes of getting answers to these and similar questions, representatives from about a dozen frequent trade show exhibitors converged here recently for a one-day seminar entitled "Getting the Most from Your Trade Show Dollars."

The seminar, sponsored by Westly Enterprises, Inc., a Palo Alto, Calif.-based conference organizer, showed attendees how their companies can boost their effectiveness as product exhibitors by following simple tips such as setting the right trade show objectives, designing an appropriate booth, using correct sales techniques and taking advantage of show services.

Each of the meeting's seven speakers urged exhibitors to follow a few commonsense "do's" and "don'ts" for maximizing their trade show divi-

dends. Some of the recommended do's and don'ts include the following suggestions.

Don't attend an industry conference simply because your competition will be there. Trade show participation should complement a company's strategic marketing and sales objectives. If exhibiting at a conference fits in well with those objectives, a company's presence at a trade show might be justified. Otherwise, a firm should stay home, regardless of what its competition decides to do.

## Hospitality Suites

Control the use of hospitality suites. Only a relatively small part of the expense of running a hospitality suite goes toward promoting future sales and attracting qualified new customers. The rest of the cost is generated by free-loaders and by a company's own personnel, lured by the promise of free food and drinks.

To hold down unnecessary expenses, show exhibitors should avoid widely publicizing their hospitality suites, nor

## Study Finds 81% Buy After Seeing NCC

NEW CANAAN, Conn. — Attendance at a major trade show is followed by the purchase of one or more items that had been exhibited, a research report released by the Trade Show Bureau at the Washington meeting of the National Trade Show Exhibitors Association indicates.

Don Vaughn, bureau president, told the meeting that a study of those who had attended the 1978 National Computer Conference in Anaheim, Calif., found that 11 months after the show, 69% had already made a purchase; within the following year, 81% of all attendees would have bought something shown at the show.

The average purchase had reached \$254,100, and about two-thirds of these had been influenced by the show visit. Copies of the report are available without charge when requested on business letterhead from the Trade Show Bureau, 49 Locust St., New Canaan, Conn. 06840. The complete research study is available at \$30 per copy.

should the suites be treated as social gathering places or entertainment centers. Rather,

they should be used as conference rooms where vendor salesmen and prospective cus-

tomers can meet privately to discuss the visitors' business-related problems and explore potential solutions.

Don't keep product literature in your exhibit booth, but if you do, at least make sure the material stays well concealed. The main purpose of exhibiting at a trade show is to get as many qualified customers as possible to stop at your booth and inquire about your product line. Such visits give booth personnel an opportunity to record the visitors' names and phone numbers and thus generate new sales leads.

When product literature is conspicuously displayed, however, prospective customers no longer have an incentive to stop at a vendor's booth and chat. They simply grab a handful of brochures and proceed to the next exhibit.

## Supershorts

A U.S. Bankruptcy Court has confirmed Inforex, Inc.'s plan of reorganization subject to completion of its pending acquisition by a subsidiary of Datapoint Corp.

plant in Arlington, Texas, in early 1982.

Neoterics, Inc. has reached an agreement in principle for its merger into the Computer Task Group, Inc.

Control Data Corp. has formed a business venture with a client, Compagnie

Generale de Geophysique (CGG), to supply the petroleum industry with a system made up of CDC hardware and CGG software.

Information Design and Human Engineering in Chicago has formed a division to provide planning and human engineering services for hardware and software firms.

## Terminals from DASI

| MODEL #         | PURCHASE PRICE |          | 12-MONTH LEASE SERVICE PRICE |  | MODEL #               | PURCHASE PRICE |          | 12-MONTH LEASE SERVICE PRICE |  |
|-----------------|----------------|----------|------------------------------|--|-----------------------|----------------|----------|------------------------------|--|
|                 |                |          |                              |  |                       |                |          |                              |  |
| TI 745          | \$1595.00      | \$216.00 | \$ 90.00                     |  | LSI 42                | \$2095.00      | \$330.00 | \$105.00                     |  |
| TI 765          | \$2895.00      | \$312.00 | \$135.00                     |  | TTY 43 AAK            | \$1350.00      | \$220.00 | \$ 70.00                     |  |
| TI 810 PKG      | \$1955.00      | \$312.00 | \$110.00                     |  | HAZELTINE 1420        | \$ 950.00      | \$180.00 | \$ 62.00                     |  |
| TI 820 PKG      | \$2295.00      | \$324.00 | \$100.00                     |  | HAZELTINE 1510        | \$1195.00      | \$204.00 | \$ 77.00                     |  |
| TI 825 PKG      | \$1795.00      | \$252.00 | \$ 85.00                     |  | HAZELTINE 1520        | \$1450.00      | \$240.00 | \$ 95.00                     |  |
| DEC LA 34       | \$1095.00      | \$108.00 | \$ 60.00                     |  | DIABLO 1640           | \$2195.00      | \$363.00 | \$105.00                     |  |
| DEC LA 120      | \$2495.00      | \$330.00 | \$135.00                     |  | DIABLO 1650           | \$2095.00      | \$363.00 | \$105.00                     |  |
| DEC VT 100      | \$1895.00      | \$187.00 | \$105.00                     |  | HEWLETT-PACKARD 2621A | —              | \$192.00 | \$ 80.00                     |  |
| DATAMEDIA DT 80 | \$2095.00      | \$187.00 | \$120.00                     |  | HEWLETT-PACKARD 2621P | —              | \$324.00 | \$150.00                     |  |
| LSI ADM 3       | \$ 850.00      | \$180.00 | \$ 50.00                     |  |                       |                |          |                              |  |
| LSI 31          | \$1370.00      | \$286.00 | \$ 75.00                     |  |                       |                |          |                              |  |

\* Quantity discounts available

\* 5% Discount C.O.D.

\* Local stocking warehouses

\* DASI is nationwide with nationwide service



DASI Systems, Inc. Corporate Offices: Cole Rd. & Camden Ave. Blackwood, N.J. 08012 (609) 226-0700. Toll Free (800) 257-7748. N.H.J. (609) 232-6810  
District Offices:  
Boston: (617) 766-8420 • N.Y.C.: (212) 584-9301 • Rochester: (716) 377-2080 • Phila.: (215) 887-8315 • R.I.: (617) 227-8880 • Wash., D.C.: (301) 458-2377 • Atlanta: (404) 440-5435  
Chgo.: (312) 887-0440 • Cleveland: (216) 473-5121 • Dallas: (214) 589-1409 • Dallas: (214) 256-5536 • Houston: (713) 682-5865 • L.A.: (310) 538-4100 • S.F.: (415) 872-1811 • Seattle: (206) 251-5070 • Portland: (503) 844-8900 • Denver: (303) 747-2522 • Phoenix: (602) 255-5034 • Minneapolis: (612) 257-7748 • Milwaukee: (414) 251-7748  
TWX #910-066-2922 BSA Contract #15-400-02334 5-81-81

## THINK BIG, THINK SMALL.

The capabilities built into our small computer will help OEMs build a much bigger market share. For complete information and pricing, call Ralph Marchitti, OEM

Manager, at  
(408) 946-5000  
or write us at  
3003 North  
First Street,  
San Jose, CA  
95134.



WE'RE OEM COMPATIBLE.

## Tired of Delivery "Hold-ups" and High Prices?

"New" isn't always "improved," even in the computer industry. Especially when your equipment arrives late with "improvements" you don't need.

Romelan offers immediate delivery of Tektronix hard copy units, Centronics printers, Perlec Tape Drives, TEC CRT Terminals and hundreds of other line units in mint condition. Every Romelan purchase carries a 90-day warranty.

EXAMPLES:  
CENTRONICS PRINTERS \$1200, now \$995  
PERLEC TAPE DRIVES \$2,000, now \$1750  
TEC CRT TERMINALS \$450, now \$350

Don't get held up! Call Romelan today for immediate delivery.

romelan industries inc.  
502 A VANDELL WAY  
CAMPBELL, CA 95008  
(408) 379-9120

## Market Far From Saturation

# France Leading Services Supplier in Europe

By Bohdan O. Szuprowicz  
Special to CW

Western Europe's information processing services markets have been growing faster than comparable markets in the U.S. in recent years.

Although Ireland is expected to show the fastest growth — at 68% — during the 1978-1979 period, France is by far the largest European supplier of such services, accounting for almost a quarter of the \$5.7 billion market and still growing at a healthy 28% annually.

The results of a study made by the European Computing Services Association (Ecsa), which represents most information processing services and consulting organizations in Western Europe, pointed out that the European market is still far from saturation.

In comparison with the American experience, the value of those services relative to the gross domestic product of Western Europe is only 75% of comparable ratio for the U.S. But the Western European market is growing at almost 16% annually as a whole, while the American growth is now down to just under 13% per year.

If such uneven growth continues for a few more years, Western Europe will catch up with the American market in size in about 1983, when both will approach \$12 billion in annual sales.

Specific to the European information processing services business is the fact that although IBM is also the largest supplier of such services, it does not enjoy anywhere near the market share it has in production and marketing of computer hardware. This in itself opens up the possibility for many enterprises to enter the field and compete vigorously for a market share.

### Fragmented Market

The European market is in fact much more fragmented than that of North America because it consists of at least 15 different national markets, each with its own peculiarities and opportunities that are creating best prospects for domestic organizations.

This explains why the top 50 European information processing services organizations can boast no more than 39% of the total market, while comparable market share of the top 50 American suppliers is almost twice as large.

Among the top 30 suppliers of information processing services in Europe are 15 French organizations, four of which — namely, GSI, CAP/Gemini/Sofeti, Cisi and SG2 — are among the five European sup-

pliers. IBM is, of course, the largest single supplier, but it is considered an American company even though it generated and sold almost \$370 million of information processing services in Europe during 1978.

The French suppliers as a group led all the other European countries with more than \$1.3 billion in sales during 1978. The country closest to

France in sales is West Germany, where information processing services and consulting sales have been estimated at almost \$950 million.

The UK, Italy, Sweden and the Netherlands are the next largest information processing supplier nations, while Ireland and Portugal are the smallest two markets in the group, valued at only \$32 million and

\$15 million, respectively, in 1978.

France's continued leadership as the largest supplier of information processing services is not entirely unexpected.

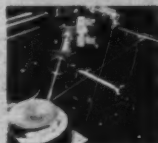
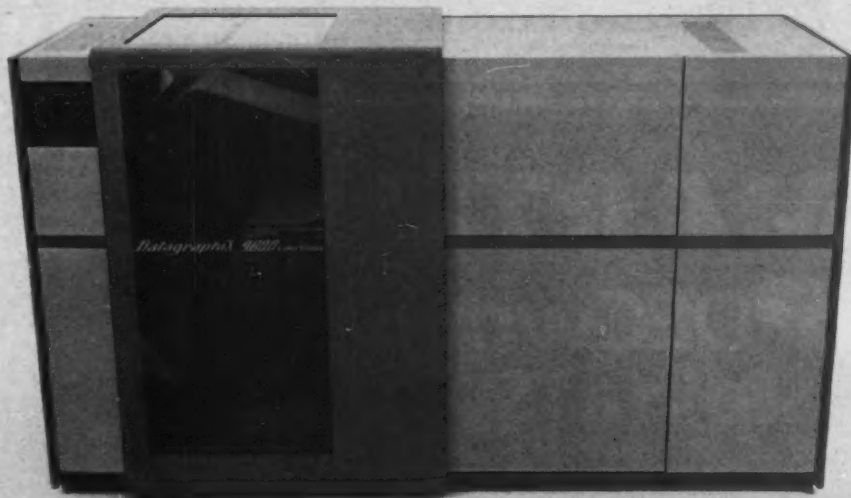
Even during the "Plan Calcul" days of the 1960s, when the French government was supporting the fledgling French domestic hardware in-

dustry, it became clear that France has neither the technology nor the market base that could hope to compete effectively with foreign (mainly American) suppliers.

At that time French DP circles and the government determined that software in all its forms would become a large and significant market as DP usage developed.

## INTRODUCING THE DATAGRAPHIX 9800 SERIES LASER PRINTERS.

A generation ahead in flexibility,  
reliability and bottom line performance.



The 9800 Series from Datagraphix® represents a new generation of non-impact printers with more

functions, more features and more reliability in a smaller, more flexible package.

**Example:** The 9800's paper path is less complex, over 25% shorter, and a lot more trouble free. And reloading can be up to four times faster.

**Example:** The 9800 is engineered for improved system availability through the use of a photo-receptor drum that can be changed in minutes.

**Example:** The 9800 prints from the very top of the page to the very bottom. Forms can be any length from 3.5" to 14". And any width from 6.5" to 15.8".

The one-to-one, parallax-free forms overlay function entails no speed reduction, and frees you from dependence on pre-printed forms. The wide variety of character fonts and spacings allows you to print attractive, high quality reports at speeds up to 21,000 lines per minute.

The 9800 Series is designed for less scheduled downtime. It takes a third less floor space. And it offers even bigger paper savings. That adds up to less cost to operate. Not to mention less cost to buy.

If you're thinking of very high

speed on-line or off-line printers, return the coupon today. We'll shed some light on laser printers for you — fast!

- ☐ Send me more information about Datagraphix 9800 Laser Printers.  
☐ Have a Datagraphix representative contact me.  
My major interest is in  
☐ on-line printers. ☐ off-line printers.

Name  (please print)

Title

Company

Address

City  State  Zip

Telephone No.

**Datagraphix®**  
a General Dynamics subsidiary

# Telecommunications Mart Seen Doubling by '90

(Continued from Page 75)  
sist of advances in optical fiber manufacturing, computer system architecture and satellite communications components and subsystems.

"The outstanding technological event in the 1980s for the telephone systems industry will be the widespread introduction of digital switching at the local exchange level," Grabhorn predicted. "Every manufacturer of switching equipment is heavily committed to this approach in devel-

oping new products. With few exceptions, carriers of all sizes around the globe will adopt digital switching technology during this decade."

Grabhorn also expects short-haul digital transmission to increase more rapidly. While long-haul transmission will vary greatly from country to country, Grabhorn believes that single-mode optical fiber holds great promise as replacement for terrestrial and submarine coaxial cable. In addition, he foresees greater use of domes-

tic satellites designed for special functional applications and a proliferation of stored program-controlled private branch exchanges (SPC PBXs).

The study predicted tremendous growth in the use of satellites for long-distance transmission, with more than a fourfold increase in Intelsat usage by 1990 (up to 200,000 voice-grade half-circuits). Efficient use of the scarce radio spectrum will be achieved by mobile radio communications equipment featuring automatic vehicle identification, digital squelch, digital status reporting and frequency synthesis, according to the study.

## World Analysis

Grabhorn believes the competitive environment within regions and countries will vary greatly during the 1980s. It will be determined largely by national policies and international marketing aggressiveness.

Analyzing the six telecommunications regions (North America, Europe, Asia, Latin America, Oceania and Africa), the study highlighted the following conclusions:

- Competition for the relatively homogeneous North American market (the only region for which private car-

riers provide most telecommunications) will center in the private buyer sector. This market is projected to be about \$6.5 billion in 1990.

- Additional restructuring of European markets is possible in this decade, continuing the shifts in market shares which occurred in the last decade.

- The Japanese will continue to invade Asian markets dominated in the past by European and U.S. suppliers.

- In Latin America, the broadest competition will be in the interconnect market sector for equipment that can be attached to public systems.

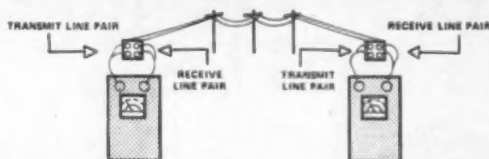
- Oceania will continue to deal with large numbers of suppliers and remain an open market, amounting to about \$1.4 billion in 1990.

- As a developing region, Africa represents a growing market for all major suppliers.

*World Telecommunications Study II 1980-1990* was completed by Grabhorn and five other key project team members, who conducted 42 in-country surveys and an analysis of more than 90% of the world's telecommunications market. Cost of the study to ADL subscribers is \$29,000; the firm is located at Acorn Park, Cambridge, Mass. 02140.

## TP-260 DATA LINE TESTER

The TP-260 Data Line Tester offers the user the ability to test both dedicated and dial-up telephone lines and get a quick indication of suitability for data transmission. The unique design of the TP-260 is such that these tests can be carried out by unskilled persons and results are read directly in terms of tariffed requirements for data lines.



- Test dedicated and dial-up lines, half and full duplex
- Hand-held, battery operated
- Audio output tests continuity, circuit noise

- Solid state, integrated circuit design
- Trouble shooting can be accomplished by unskilled personnel



TeleProcessing Products, Inc.

Local Data Distribution

4565 E. Industrial St., Bldg. 7K, Simi Valley, CA. 93063 (805) 522-8149

## SMARTEN UP DECwriters Slip in a TSU

(Telecommunications Storage Unit)

- Cuts line costs 50%
- Powerful Send/Receive buffer
- Batch transmission to 1200 Baud
- Text Editor and Forms Control
- Simple to install and operate
- TWX, DDD or Telex Interface

Contact your teleprinter supplier or



505 E. Middlefield Rd.  
Mountain View, CA 94043  
(415) 969-3700

## Acquisitions

### Triumph Adler Activities Consolidated Into Pertec

LOS ANGELES — Computer product development, marketing and service for two subsidiaries of Triumph Adler, Inc. are being consolidated into Pertec Computer Corp.

Thomas H. Elrod, Pertec senior vice-president, said 200 people at more than 20 Royal Computer Systems domestic field and headquarters locations are already in the process of integrating into the Pertec systems marketing and service divisions. Integration of computer-related activities for Triumph Adler's Pertec and Royal units into one organization will strengthen the channels of distribution, product development and field support activities in the U.S., he added.

The resulting domestic computer systems organization will continue to market the 8000 and 9000 series of small computers developed by Royal as well as the PCC 2000 small business system manufactured by Pertec. Field service personnel will be cross-trained to support Pertec products and the 8000 and 9000 series of computers as well as various other computer products previously serviced by the Royal computer products organization.

Pertec is a wholly owned subsidiary of Triumph Adler, which in turn is owned by Volkswagen AG.

### Other Moves

EG&G, Inc. has acquired Almond Instruments Co., Inc. through an exchange of common stock. Almond Instruments, located in Covina, Calif., develops and manufactures custom power conversion systems.

Digital Scientific Corp. has acquired Computer Office Systems, Inc., pro-

ducer of an office business and word processing system.

Total Systems, Inc. has acquired Performance Systems of Indianapolis, which specializes in computer resource monitoring.

National Data Corp. has announced an agreement in principle for the acquisition by National Data of Cisco, Inc., a financial DP subsidiary of the First National Bank of Atlanta.

Automatic Data Processing, Inc. has acquired Business Systems Research, Inc., a supplier of computerized tariff data bases and accounting and documentation systems.

Anacomp, Inc. has completed the acquisition of Computer Management, Inc. for stock and cash totaling \$1.4 million.

Tandy Corp. has reached an agreement in principle with the shareholders of Lika Corp., manufacturers of double-sided and multilayer printed circuit boards, to acquire Lika for \$4.5 million in cash and notes.

Remote Computing Corp. has completed negotiations for the acquisition of Fiscal Recovery Associates, Inc. of San Mateo, Calif.

Sytek, Inc. has acquired Network Resources Corp., a data communications equipment firm specializing in broadband cable television interface hardware and related technologies.

Cuadra Associates, Inc., a Santa Monica, Calif.-based R&D firm specializing in on-line data base systems and services, has acquired the staff and resources of Knowledge Resource Consultants, library systems specialists.



## Projected \$2 Billion for 1985

# Exxon Expected to Make It Big in Information

NEW YORK — Despite current problems with management defections and antiquated word processors, Exxon Corp. will stick it out and make it big in information, according to a report published by Northern Business Intelligence, Inc., a market research firm based here.

Major advancements in word processing, DP, computer components, telecommunications and electronic funds transfer (EFT) systems will put Exxon back on the leading edge, the report said. Northern further speculates that Exxon information sales will top the \$2 billion mark by 1985.

Exxon office product ventures — Qwip, Qyx and Vydec — all achieved

early market success, but recently Exxon has been losing ground, particularly in word processing. Despite the introduction of the new 2000/4000 word processors and Network shared resource system, Vydec will have problems regaining market share, the report said.

Xonex, another Exxon company in the development stage, may become Exxon's star in the word processing field, overshadowing both Vydec and Qyx.

### Committed to Micro Systems

Exxon is committed to microcomputer system development through Zilog, Inc. and the recently formed Sum-

mit. Zilog has just introduced an Ethernet-type networking system for its micros, and Northern speculated that Zilog may soon supply end-user markets.

Northern predicted that Exxon's office product sales will grow from \$146 million in 1979 to \$695 million in 1985.

While full systems integration is some time off, Northern said Exxon is paying close attention to integrating the organizations of its disparate information operations and to developing networking capabilities. Four distinct paths to systems integration are being pursued. Northern believes software development may be Exxon's biggest

problem in tying the loose ends together.

Through Dialog, Kyles, Inc., Magnex Corp., Zilog and others, Exxon is leaving essentially no stone unturned in components and subsystems for information processing, storage, display and entry, Northern said. Component sales were forecast by Northern to grow rapidly from their 1979 level of \$49 million.

Exxon has launched a broad assault on the telecommunications business, the research firm reported. Intecom, Inc., a new venture, has announced its first product: an advanced data/voice switch.

(Continued on Page 84)

# Get a terminal with teeth in it.



*Regent*® 25 from ADDS has many features you'd expect to find only in more expensive terminals.

Features like a separate keyboard cluster with 18-key numeric pad... a "print transparent" capability so you can talk directly to the peripheral... a special keyboard feature that turns the terminal into a line monitor... and built-in character sets that let you switch-select to any of six languages.

ADDS terminals don't just look better. Dollar for dollar, they perform better. And that's something to chew on.

For more information and the name of your nearest distributor write: Displays Division, Applied Digital Data Systems Inc., 100 Marcus Blvd., Hauppauge, N.Y. 11787. Or call (516) 231-5400.

See us at the FEDERAL COMPUTER CONFERENCE, Booth 1235.

# ADDS

SOMETHING EXTRA IN EVERYTHING WE DO

# TERMINALS

## THESE DISTRIBUTORS CARRY ADDS TERMINALS EXCLUSIVELY:

### \*NATIONAL

General Electric ICES  
Kierulff Electronics  
Rental Electronics  
TISCO

### \*REGIONAL

**EASTERN**  
Computrend, Inc.  
Manchester Equipment Co.

**MIDWEST**  
CG Distributors  
Lowry & Associates  
SEA Distributors

**SOUTHERN**  
CMC Marketing Corp.  
Tel-Tex, Inc.  
Veytec, Inc.

**WESTERN**  
Digital Systems Marketing  
Group III Electronics

### LOCAL

Arch Associates, Lansdowne, PA  
Compusystems, El Paso, TX  
Computer Systems & Services,  
Springfield, OH  
Data Communications Corp.,  
Memphis, TN  
Data Management Solutions, Inc.,  
Wichita, KS  
Datco, Inc., Eugene, OR  
Digital Systems & Services, Inc.,  
Falls Church, VA  
Digital Systems Marketing,  
San Diego, CA  
Moore Data Systems,  
Baton Rouge, LA  
National Information Systems,  
Alexandria, VA  
NIS/Comtec, Southfield, MI  
NIS/Distributed Data, Raleigh, NC  
NIS/Keystone Data,  
Maple Shade, NJ  
Northeast Data Systems,  
Burlington, MA  
Ossmann Instruments, Inc.,  
Syracuse, NY  
Pro-Com Sales, Elk Grove, IL  
The Computer Store, Jackson, MS  
Western Micro Systems,  
Sunnyvale, CA  
Western Microtechnology,  
Cupertino, CA

\* Multiple locations—Check your local directory.

## Case for Intangibility

# Software Tax Proposal Blasted in Bay State

By Marguerite Zientara  
CW Staff

BOSTON — A proposed regulation of the Massachusetts Department of Revenue that would tax off-the-shelf software, time-sharing, keypunching, data conversion and some output services came under heavy fire last week at a public hearing here.

After an impromptu change of venue due to the unexpectedly large attendance — more than 100 people overflowed a room designed to hold 50 — Tax Commissioner L. Joyce Hampers opened the hearing at which 15 businessmen, both DP and non-DP, pleaded their case for the intangibility of software and services.

Software may be entered into a computer directly or via telephone lines with no tangible personal property and

with the identical result as if tangible property were used as the input communications medium, software tax hearing veteran Robert M. Sherin, nonjudicial legislative adviser for the Data Processing Management Association (DPMA), told the tax commissioner.

This point was the first of five key arguments used successfully by the DPMA in New York, Florida, Rhode Island, Wisconsin and Michigan.

### DPMA Presents Case

Furthermore, the DPMA argued:

- Such communications media are merely an intermediate means of entering software into a computer on a one-time basis before it is transformed into its intangible end state of binary pulses.

- Tangible property, if any, is either destroyed or reused after being used to transfer the intangible information therein to the computer on a one-time basis, leaving instructions (program) and information (data) in the computer in the form of binary pulses as the intangible end state.

- The value of such tangible property is small — 5% or less — in comparison to the value of the intangible software.

- Any tangible property, if used, has virtually no value in itself. Any value is in the information which is valuable only when read and transformed by the computer into its intangible end state of binary pulses.

Sherin likened computer output to an accountant's reports, a court reporter's paper tape and a typist's typed sheet — objects that are considered intangible for tax purposes because the objects are inconsequential to the information contained therein.

Addressing the Department's proposed taxation of keypunching, S. Paul Blumenthal, vice-president of American Computer Appraisal Service here, termed the idea "discriminatory" since it would "amount . . . to taxing labor."

He also stressed that computer software object code, or machine-readable program language, has been found to be intangible and nontaxable in federal court, and therefore that finding should hold for Massachusetts.

After discussing the "true object" of a DP transaction as being the intangible information — a recurring theme at the hearing — Ronald J. Palenski, attorney for the Association of Data Processing Service Organizations, Inc. (Adapso), further claimed that the Department of Revenue's distinction between prewritten and custom programs is "artificial and irrelevant."

"In both instances," he noted, "what is sought by the customer is the professional skill and intelligence represented by the program."

Citing New York, California, New Jersey, Wisconsin, Texas and "many other" states that do not tax time-sharing services, Palenski isolated a key issue in Massachusetts' proposed rule regarding whether a customer controls or operates the computer in a time-sharing situation.

"There is never exclusive use by any particular customer, nor does any customer have the right or the means to exclude others from the system," Palenski explained. "No single customer controls the hardware, or decides when a job will be done — the computer decides that."

Hampers set a time limit of 60 days for further written or oral statements from interested parties.

Comments should be directed to John White, chief of the Rules and Regulations Bureau, Department of Revenue, Room 810, 100 Cambridge St., Boston, Mass. 02204.

## Exxon Expected to Make Big

(Continued from Page 83)

Intecom will have difficulty breaking into the market, but with leading edge technology and Exxon resources, this small company will make it, Northern said.

Last year's purchase of Reliance Electric Co. has thrust Exxon into the nuts and bolts carrier, voice frequency, outside plant and power markets.

Other Exxon communications products include communications controllers, voice recognition-based network

controllers and fiber-optic data links.

In EFT systems, Periphonics may build its credit authorization terminal line into the point-of-sale terminal area, the report said. But Northern believes Exxon is assessing its future in EFT and has no plans for automated teller machines or integrated EFT systems development.

The complete report is available for \$250. Northern Business Intelligence is at 150 Nassau St., New York, N.Y. 10038.

## EASTERN AIRLINES EDUCATION

PRESENTS

### UNIVAC 1100 TRAINING

COURSES BEGINNING NOVEMBER 3

Some Courses Being Offered:

- ASET Programming
- ASET Internals
- CMS
- MASM
- DMS-1100 Programming
- USAS
- Programming Theory
- SSG

All courses are held in Miami, Florida

For more information regarding tuition and start dates, call collect:

**GAIL FRASER**  
**(305) 873-6526**



# HP has an answer for companies that are waiting for things to get better.

**Our new HP 3000-III price makes it easier  
for you to increase productivity right now—  
when you really need to.**

You don't have to wait. Our HP 3000-Series III can help make things better for your business now. Because we've built so many capabilities into the computer, your EDP people will be able to get the work done quicker and more efficiently. And our new price of \$92,000—a \$15,330 reduction—means you'll start saving from the day you buy one.

What's more, to help you get the most from your system, we'll include a free COBOL II software package—normally priced at \$3000—if you buy your HP 3000 before November 1.

We're also offering a special introductory price of \$5000 on our text and document processing software package, TDP/3000. And we've reduced the price of the HP 3000 graphics workstation by 14% to \$14,900.



**\$92,000**  
Formerly \$107,330

Our HP 250 can make a big difference to your productivity, too. Either as a remote workstation for your HP 3000 distributed system or as a stand-alone.

If you buy an HP 3000 before November 1, you can get an HP 250 with a 12MB Winchester disc for \$15,333. That's a \$7600 savings on one of the world's most advanced small business computers.

So stop waiting for things to get better and start making them better. With an HP 3000 computer. To order, contact your nearest Hewlett-Packard sales office listed in the White Pages.

**Buy an HP 3000-III  
and save 30%  
on an HP 250  
system.**



**hp HEWLETT  
PACKARD**

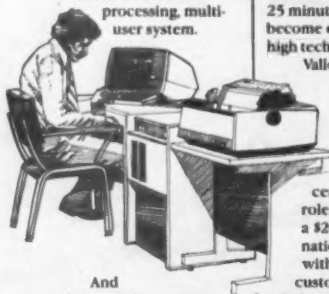


# POSITION ANNOUNCEMENTS

## What's an international, high technology company like MDS doing in a cozy little town like Los Gatos?

### Plenty.

And if you're a software development pro, there's plenty for you to do here, too. We're assembling a select team of software specialists to develop systems software for our exciting next generation product line—an advanced microprocessor based distributed processing, multi-user system.



And there aren't many places more conducive to professional creativity and personal development than our Advanced Development Center in the rural setting of Los Gatos, California.

When you explore Los Gatos, you'll taste the

artistry and culture of Olde California in a small town nestled at the foot of the beautiful Santa Cruz Mountains. From the cozy atmosphere of old time saloons, restaurants and more antique shops than you thought could exist in one place, you can drive 25 minutes West and stand on the rugged Pacific coastline, or drive 25 minutes East and become engulfed by the high technology of Silicon Valley in Santa Clara.

And when you explore a position with MDS, you'll see that our development center plays a key role in making MDS a \$200 million, multinational corporation with the 2nd largest customer base in the industry. That's why we can offer you the stability and career pathing you should expect from a leader.

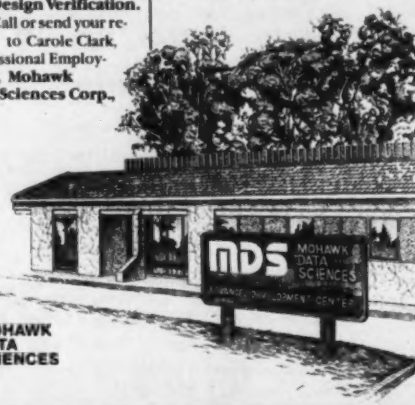
Investigate our excellent opportunities for Systems Program-



mers and all software development professionals in the areas of O/S Development, Data Base Design, Communications, Systems Architecture, Product Planning and Design Verification.

Call or send your resume to Carol Clark, Professional Employment, Mohawk Data Sciences Corp.,

Advanced Development Center, 102 Cooper Court, Los Gatos, CA 95030; (408) 395-2160. We are an equal opportunity employer m/f/h.



**MDS** MOHAWK DATA SCIENCES

## We'd like to lock you in.

Into just the right Data Processing career spot that suits your needs and background. That's what we do exclusively. And that's why D.P. Professionals see us first when they are looking for a new or different position... one that gives them growth and satisfaction. Interested? Simply call or write in confidence:

N.Y. — 535 5th Ave., New York 10017 (212) 967-2650  
N.J. — 30 Vreeland Rd., Florham Park 07932 (201) 966-0900  
Calif. — 3255 Wilshire Blvd., Los Angeles 90010 (213) 364-4900  
Texas — 3050 So. Post Oak Rd., Houston 77059 (713) 961-3600

the  
**jarvis walker**  
group

### Software Development

APPLIED DATA RESEARCH has several outstanding career opportunities currently available for intermediate and senior programming personnel.

Positions involve assignments as software developers in the following ADR product groups:

VOLLIE® DOS/LOOK® MetaCBO®  
On-line ETC® The LIBRARIAN® and  
new product development.

Candidates must have:

- Minimum of two years programming experience
- Strong IBM Assembly language skills

ADR offers:

- Excellent compensation package
- Superior comprehensive benefits program
- Exceptional work environment

Additional information may be obtained by calling Mr. Ed Smith collect, at (201) 874-3033. Resumes may be sent, in confidence, to:

Personnel Director

APPLIED DATA RESEARCH, INC.  
Route 206 and Orchard Road, CN-8  
Princeton, New Jersey 08540

An Equal Opportunity Employer m/f/h/v

**ADR**

position announcements

position announcements

position announcements

position announcements

position announcements

# The Bay Area,

**San Francisco - The City!!!**  
 Planning a vacation in our area?  
 We represent clients with hundreds  
 of current job openings in  
**Northern California.**  
 If you're a professional, use a  
 professional for your search.

- Systems Programmers: OS/MVS/IMS, DOS/VS/CICS
- COBOL Programmers—move into IBM DB/DC
- Project Leaders: Banking, Manufacturing, Retail
- Auditors
- Data Base Administrators
- MINI'S—Programmers, Senior Analysts, Client Support
- Systems Analysts
  - Stock Transfer
  - Trust Administration
  - Bank Check Processing
  - Commercial Loans
  - Retail
  - Manufacturing
  - Banking

**ROBERT HALF**  
**OF NORTHERN**  
**CALIFORNIA, INC.**

Jerry Anderson or Bob Couch  
 (415) 434-1900  
 111 Pine St., 15th Floor  
 San Francisco, Ca. 94111

Jim Dupre  
 (415) 493-8700  
 2 Palo Alto Square, Suite 212  
 Palo Alto, Ca. 94304

## SUNBELT OPPORTUNITIES

For professional and geographic fulfillment, the Sunbelt is where it's at. Enjoy a challenging work environment in "State-of-the-Art" installations and, in your leisure time, enjoy a life-style that blends with a temperate climate. Our Fortune 500 clients are seeking qualified EDP professionals with a minimum of one (1) year experience in an IBM environment. Client companies assume all fees including interviewing and relocation costs. Please send your resume in CONFIDENCE OR CALL TOLL FREE 1-800-821-2280 X 804 (in Mo. 1-800-892-7655 X 804).

| DATA BASE                             | TO       |
|---------------------------------------|----------|
| Data Base Administrator(s) IMS:IDMS   | \$30K    |
| Data Base Analyst(s)                  | \$28K    |
| Sr. IMS Systems Prog(s)               | \$28K    |
| IMS Systems Prog(s)                   | \$26K    |
| APPLICATIONS:                         | TO       |
| Project Leaders IMS/VS,MFG,COBOL      | \$28K    |
| Project Leaders MFG                   | \$26K    |
| Sr. Systems Analyst(s) IMS/VS,COBOL   | \$25K    |
| Systems Analyst(s) CICS MFG/Financial | \$24K    |
| Programmer/Analyst(s) IMS/VS          | \$24K    |
| Programmer/Analyst(s) COBOL/ALC       | \$22K    |
| Programmer(s) COBOL/ALC,DOS/OS        | \$14-20K |
| TECHNICAL SUPPORT                     | TO       |
| Sr. Systems Prog(s) MVS-SYSGENS       | \$30K    |
| Systems Prog(s) OS-SYS-MVT SYSGENS    | \$26K    |
| Systems Prog(s) OS/DOS: ALC,CICS      | \$18-24K |



CONTACT BILL DENNY, V.P.

**Jim King and Associates**

1840 Gulf Life Tower/Jacksonville, Florida 32207  
 (904) 398-7371

## GET AN EDP JOB ANYWHERE

CALL FREE  
 8-812/338-6714  
 CALL COLLECT



Analysts, project leaders, programmers with more than a year's experience let us help you find a better job. For a decade we have been placing EDP professionals like you all over the country through our network of 22 national offices. Send your resume or call

**Electronic Systems Personnel**

858 TCF Tower 121 So. 8th Street  
 Minneapolis, MN  
 client companies assume our fee.



EDP Placement Specialists

A Member of National Computer Associates

## High Level Computer Network Protocols

Explore system programming opportunities with our expanding Corporate Programming Technology Center and participate in the design and implementation of an international network providing an integrated collection of high level computer network protocols.

The basic host-host, terminal access, file transfer, data transfer, net mail and distributed job execution protocols will be implemented via a unique Network Support System consisting of a distributed collection of IBM 4300 class systems providing a controlled installation environment. Subsequently, applications oriented protocols supporting data base access, software construction, and other specific applications, will be constructed.

Some international travel may be required.

MS or PhD in Computer Science preferred, along with 2 years experience with IBM Computers. Knowledge of VTAM, VM/CMS and DOS/VSE a plus.

To arrange a convenient interview, please send complete resume to Manager of Professional Staffing, CW-98.

**ITT Advanced Technology Center**

One Research Drive, Shelton, Conn. 06484.

An Equal Opportunity Employer, M/F

## CONNECTICUT

**BREEN DATA**

- STAMFORD/Tony Aceto  
 (203) 322-5761
- HAMDEN/Toby Brimberg  
 (203) 288-7461
- HARTFORD/Jane Sheehan  
 (203) 247-9112

THE DATA PROCESSING  
 PERSONNEL SERVICE  
 Representing:

- PROGRAMMERS
- SYSTEMS ANALYSTS
- SOFTWARE
- DP MANAGEMENT

BREEN DATA □ 3780 Whitney Avenue, Hamden, Connecticut 06518

## DATA BASE ADMIN. to \$38,000

Prestigious, major health care institution in desirable California location seeks DBA. Data base design, use of IMS utilities, and solid knowledge of DL/I or IMS DB. Superior benefits, including 3 weeks vacation first year.

WESTERN HEALTH RESOURCES  
 P.O. BOX 48018  
 LOS ANGELES, CA. 90048

position announcements

position announcements

position announcements

position announcements

position announcements

## Programmers-Analysts

# CAN YOU MEET THIS STATE OF THE ART CHALLENGE IN DATA COMMUNICATIONS?

If you can, Honeywell offers you an outstanding opportunity to build an exciting career at the forefront of advances in data networking and communications systems.

You will join a rapidly growing Honeywell group working in the Minneapolis, Washington, D.C., and Phoenix areas, undertaking new long-term projects which range from pure communications to sophisticated new networking applications.

## OPENINGS AT ALL LEVELS

From the junior level to the most senior, these positions will challenge your talents, energies and enthusiasms. We prefer that you have a BS in Computer Science or a related field, with Assembly language expertise and at least two years of communications and/or operating experience. Mini computer experience is a plus.

The more advanced positions require appropriately greater capabilities and expertise. Project leaders and team leaders are sought to spearhead work in individual areas. In almost all cases, you will have the chance to follow your projects from conception to completion.

### Honeywell Also Offers New Careers in ...

- Minicomputer Systems
- Operating Systems
- Data Base Systems
- Advanced Software Systems
- ... to Systems Analysts, Programmers and others with Honeywell experience.

## RUSH YOUR RESUME NOW

This is truly a rare opportunity to advance your career personally and professionally. You've heard the phrase, "Once in a lifetime." This time, take it seriously. Send your resume and salary history in confidence to Mr. Don O'Grady, Honeywell Federal Systems Operation, 7900 Westpark Drive, McLean, Virginia 22102. An equal opportunity affirmative action employer, M/F/H.

... AT  
**YOU CAN Honeywell**

## Computerized Graphics

The graphics industry is experiencing dramatic growth. It offers some of the most exciting opportunities available today. If you have current graphics experience, or have a minicomputer software background and would like to look into this field, write or call today at no cost or obligation.

### Graphics Programmers \$30K+

Design, develop and implement CAD applications for this leading New England graphics vendor. FORTRAN and scientific applications required. New grads with technical BS or MS will be considered. Similar West Coast opportunities available.

### Director Software Support \$39K+

Take charge of new group responsible for supporting vendor's established graphics products. Prior hands-on mini applications programming and demonstrated leadership ability a must. Annual bonus. West Coast location.

### Project Leader \$30K+

Supervise programmers in development of CAD systems. Advanced degree in math or C.S. considered in lieu of experience. Annual bonus. East Coast location.

Call toll-free 1-800-343-9861. Connecticut residents, call 528-9393.

**Identity Search**  
A division of Dunhill of Hartford

111 Founders Plaza, East Hartford, CT 06108 All fees are assumed by client companies.

### Instructor/Data Processing

Position open to teach in a two-year program. Knowledge of RPG, COBOL required. Basic desirable, also, data systems analysis, design and communications desired. Minimum of two (2) years occupational experience required. Associate degree preferred. This is an "On-Line" network of computers using DBMS communication software. Teaching experience preferred. Closing date is October 15th and starting date is November 1st. Apply to Central Technical Community College Area, Douglas Adler, Personnel Manager, P.O. Box C, Grand Island, NE 68801; (508) 384-8225.

AN EQUAL OPPORTUNITY AFFIRMATIVE ACTION EMPLOYER

## MARKETING PROFESSIONALS

Needed for a rapidly expanding credit union data processing company. USERS Incorporated is a national service company with an expanding group of professional employees. If you have experience in Marketing On-Line and/or In-house Accounting Systems, contact Jim Spaulding.

**USERS Inc.,**  
1250 Drummers Lane  
Valley Forge, PA 19482  
or call 800/523-7282.

## Senior Programmer Analysts

### There's More to Memorex Than Meets the Ear!

And we will do a lot more than talk about opportunity! As a leading international manufacturer of quality tape products for video recording, consumer products, data recording and data storage, Memorex will show you how our environment can further your career.

Our Computer Media Group is looking for talented Data Processing Professionals to completely design and implement a new Management Information System for our corporate Physical Distribution Division. Working in an OS/MVS environment, you will integrate inventory control, forecasting, purchase orders and other modules into a distribution system network. Candidates should have strong programming skills using COBOL; experience with IDMS, Taskmaster, or similar packages helpful. Good interpersonal skills needed.

We offer a fine compensation package and true growth potential. Act now by sending a letter or resume to: **Memorex Corporation, MS0017, Dept. KD-12, 1200 Memorex Drive, Santa Clara, CA 95052.** An equal opportunity employer.

**MEMOREX**  
Computer Media Group

**M&S**  
COMPUTING

## ENGINEERS SALES ENGINEERS TECHNICAL SUPPORT FIELD ENGINEERS

Compute a rewarding career with an inventive leader in an expanding worldwide market .... **M&S COMPUTING**

M&S Computing is a leader in the "turnkey" interactive graphics field. We currently have installations in many of the major engineering firms and corporations in the world. We are now undergoing remarkable growth and are becoming known as the interactive graphics support corporation for a number of engineering disciplines. If you have a technical background and are a self-motivated person with proven experience, we offer a challenging and interesting career opportunity.

- CIVIL ENGINEERS
  - PIPE ENGINEERS
  - MECHANICAL ENGINEERS
  - INSTRUMENTATION ENGINEERS
  - SOFTWARE ENGINEERS
  - GEOPHYSICISTS
  - STRUCTURAL ENGINEERS
  - PIPE SUPPORT ENGINEERS
  - ELECTRICAL ENGINEERS
  - PROCESS ENGINEERS
  - SPECIFICATION ENGINEERS
  - PETROPHYSICISTS
- DESIGNERS (ALL DISCIPLINES)

These positions offer competitive starting salaries commensurate with experience, liberal fringe benefits and exceptional opportunities for career development.

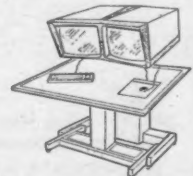
Please send resume and salary requirements to:

Dianne Maples

**M&S**  
COMPUTING

P.O. Box 5183  
Huntsville, AL 35805  
(205) 772-3411  
TWX 810-726-2180

An Equal Opportunity Employer



**OS/MVS  
TSO**

Tel 702/396-0630  
TUE 9 pm

### PROGRAMMER-ANALYST CICS-CMS

2 YRS + IN  
COBOL, ALC OR PL/I  
TO \$36,000  
NATIONWIDE

**Cybermetrics  
Corporation**  
P.O. Box 579  
McLean, VA 22101





## position announcements

## position announcements

## position announcements

## position announcements

## position announcements

## Associate Principal Programmer

Seeking Associate Principal Programmer to perform software requirement analysis, design, implement, test and support various software modules of a CAD/CAM system ranging from graphics database, command processors, graphics entity construction and transformation to graphics display utilities with special emphasis on the industrial drafting applications in the mechanical engineering area. M.S. in Computer Science and one year experience required, or one year experience in application programming. Also required are strong mathematical capabilities especially in manipulation of 3-D geometries and numerical methods, knowledge in database, formal language, programming principles and performance factors, basic understanding about computer graphics and general engineering practices. Salary \$24,500. 40 hr. week. Send resume to N. Swanson, Computervision Corp., 201 Burlington Rd., Bedford, MA 01730.

Changing  
Imagination  
Into Reality.



## An EMPLOYMENT AGENT

- Helps identify opportunities
- Helps market your skills
- Prepares you for interviews
- Negotiates on your behalf
- Gives advice on companies

## LET US BE YOUR AGENT



The DP Center  
4151 SW Freeway  
Suite 450  
Houston, Tx. 77027  
(713) 960-9102

## DP PROFESSIONALS

Advance your career in the location of your choice! If you have a minimum of 1 year of experience, call collect (or send resume) to:

to: Betty deMarcelis

## DEALY ROURKE PERSONNEL

1006 West End Blvd.  
Suite 121  
Nashville, Tenn. 37203  
(615) 329-1771

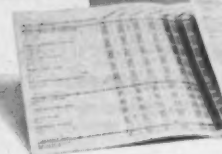


## Computer Professionals...

## Are you making as much money as you should be?

To find out, call today for our new local survey  
It's FREE!

1980  
Local  
Metropolitan  
Computer  
Salary Survey



## Includes 23 New Categories

The 1980 Survey has been expanded to provide specific data for 23 new categories. These include positions in data communications, mini/micro programming, data base administration, technical marketing support and EDP auditing in addition to our traditional categories of programming, software, systems design, management and computer marketing.

Do you know how your salary compares with other EDP professionals in your specialty—with the same level of experience—working in your city, or in other cities across North America? Are you being well paid for what you do? Are salaries better elsewhere?

Now you can find out simply by calling today and asking for a copy of our current 1980 Local Metropolitan Computer Salary Survey. It's FREE!

Source Edp, North America's largest recruiting firm specializing in the computer field, publishes this valuable Survey annually as a service to computer professionals from coast to coast. The 1980 Survey shows current salaries in your area, 37 other areas in the U.S. and Canada, plus overall national averages. Salaries are shown by career specialty broken down by length of experience or size of computer system.

As you will discover, this Survey can be extremely valuable in helping you make important career decisions. Call for your free copy today.

For your free report, simply phone the Source Edp office nearest you.

source  edp

If unable to call, write Source Edp, Dept. CL7  
100 South Wacker Drive  
Chicago, Illinois 60606

(When writing, please be sure to indicate home address and position title. Client companies assume our charges.

## United States

Arizona

Phoenix 602/258-9333

California

San Francisco 415/434-2410

Palo Alto 415/856-0800

Los Angeles 213/386-5500

Van Nuys 213/781-4800

Torrance 213/540-7500

Irvine 714/833-1730

San Diego 714/231-1900

Colorado

Denver 303/773-3700

Englewood 303/571-4450

Connecticut

Hartford 203/522-6590

Stratford 203/375-7240

District of Columbia

202/466-5890

Florida

Miami 305/624-3536

Georgia

Atlanta Central 404/568-9350

Atlanta 404/325-8370

Illinois

Chicago 312/782-0857

Northfield 312/446-8395

Oak Brook 312/986-0422

Rolling Meadows 312/392-0244

Indiana

Indianapolis 317/631-2900

Louisiana

Baton Rouge 504/924-7183

New Orleans 504/561-6000

Maryland

Baltimore 301/727-4050

Towson 301/321-7044

Massachusetts

Boston 617/482-7813

Wellesley 617/237-3120

Michigan

Detroit 313/259-7807

Southfield 313/352-6520

Minnesota

Minneapolis 612/544-3680

St. Paul 612/291-2467

Missouri

St. Louis County 314/862-3800

St. Louis 314/231-4880

Downtown 816/474-3393

Kansas City

816/474-3393

New Hampshire

Nashua 603/880-4047

New Jersey

Cherry Hill 609/482-2800

Edison 201/494-2800

Paramus 201/845-3900

New York

Midtown 212/736-7445

Wall Street Area 212/962-8000

Long Island 516/364-0900

White Plains 914/683-9300

North Carolina

Greensboro 919/378-1642

Ohio

Cincinnati 513/769-5080

Cleveland 216/771-2070

Columbus 614/221-2070

Oregon

Portland 503/223-6160

Pennsylvania

Philadelphia 215/665-1717

King of Prussia 215/265-7250

Pittsburgh 412/261-6540

Texas

Dallas 214/367-1600

Fort Worth 817/338-9300

Houston Central 713/751-0100

Houston 713/626-8705

San Antonio 512/344-0217

Virginia

McLean 703/790-5610

Washington

Seattle 206/454-6400

Wisconsin

Milwaukee 414/277-0345

Toronto 416/865-1125

Don Mills 416/425-5730

## PROGRAMMER ANALYST

An opening has developed in a growing and challenging environment for an individual with a minimum of 3 years experience. The successful candidate must have at least 2 years of advanced education, good communication skills, proven analytical exposure in developing business systems, preferably in a manufacturing facility and some background in a timesharing EDP shop. Experience with PDP11's, RSTS/E and DDP are a plus. Excellent pay benefit package.

Trent Tube is a world leading manufacturer of welded stainless steel pipe and tubing.

Send resumes including salary requirements to Personnel Manager



Colt Industries  
Trent Tube Division

East Troy, WI 53120

Equal Opportunity Employer M/F

## SYSTEM PROGRAMMER &amp; Others

"Ideal University Environment"  
IBM 4341, 4-Meg. Adm/Academic Appl's

Systems Programmer  
IBM: DOS/VSE, VM or OS, ISAM, VSAM. Must interface with Communication Specialist and DB Designer.

Communications Specialist  
IBM: CICS, BTAM or VTAM, 3705 Communications Controller, and EPI-VS or NCP/VSE.

Data Base Designer  
Familiarity with a DBMS, a Data Dictionary, and CICS Interface or equivalent.

Minimum Qualifications: Bachelor degree, 3 - 5 years experience, SU career-minded, professional, and ability to get along with people.

Immediate openings.  
Salary negotiable.

Send Resume or call collect:  
Roland F. Caray

133 Allain Hall Southern University  
Baton Rouge, LA 70813  
Dt: 504/771-4410 Hs: 504/775-8118

## TIME SHARING COORDINATOR/ ASSISTANT DBA FLORIDA

Red Lobster Inns, the nation's largest full service, seafood restaurant chain, has an opening in our IBM 370/148 VM CMS OS shop for a Time Sharing Coordinator/Assistant DBA. We offer you the opportunity to further develop your data processing expertise in a very sophisticated results-oriented environment.

We offer:  
• Excellent salary and benefits  
• Paid relocation to Orlando, Florida  
• Opportunity for promotion and continued career development

We are seeking a data processing professional with a minimum of five years experience in COBOL, PL/I, ALC, FORTRAN, CMS or TSO and DBMS. Additional prerequisites include systems analysis experience, excellent interpersonal skills and exposure to systems programming in a 370 environment.

If you qualify, send your resume with SALARY HISTORY to Dept. DJP, Red Lobster Inns, P.O. Box 13330, Orlando, Florida 32859.



Red Lobster

An Equal Opportunity  
Affirmative Action  
Employer M/F/H/V

position announcements

position announcements

position announcements

position announcements

position announcements

## HOUSTON LIGHTING & POWER CO.

Nation's Sixth Largest Electric Utility

Despite the recession, Houston retains one of the strongest economies in the world! As the nation's 6th largest electric utility, Houston Lighting & Power Company, continues as one of the fastest-growing electrical utilities in the country!

To fill The Light Company's increasing demands for energy services, we're in need of the following:

### COMMERCIAL APPLICATIONS PROGRAMMERS

#### SENIOR PROGRAMMER ANALYST

Minimum of 4 years experience which must include 2 years of programming in ALC or COBOL.

#### PROGRAMMER ANALYST

Minimum of 2 years experience in programming with ALC or COBOL languages.

#### PROGRAMMER

BS/BA degree in Computer Science, Accounting, Math or any 4 year degree with a minimum of 12 hours of Computer Science (plus 2 years work experience).

#### Minimum Requirements:

BS, BA degree in Math, Computer Science, Accounting, or any 4 year degree with a minimum of 12 semester hours in computer science or equivalent work experience. The individual must program in COBOL or ALC languages. Hardware oriented with large IBM and ANDAHL. Software oriented in OS/MVS, IDMS, LEXICON, TSO, CICS.

Houston Lighting & Power Company provides its professionals with a top salary and full benefits package.

Qualified persons please submit your resume in strict confidence to:

**B.L. Gble**  
Recruiting Division  
**HOUSTON LIGHTING &  
& POWER CO.**  
P.O. Box 1700  
Houston, Texas 77001



Lighting the way to a brighter future.



We Are An Equal Opportunity Employer M/F

### PROJECT MANAGERS Need a Career Breakthrough?

D.P. Careers can be made through the successful implementation of KEY applications. If you are up for a challenging project, we have listed below some CAREER-ACCELERATING opportunities to manage high visibility projects.

|                                      |             |
|--------------------------------------|-------------|
| Manager Manufacturing Projects       | To \$45,000 |
| Rapidly Growing Electronics Mfg. Co. |             |
| Staff Manager (S & P)                | To \$40,000 |
| MVS, COBOL, IDMS, CICS               |             |
| Minicomputer Projects                | To \$35,000 |
| New Development, New Hardware        |             |
| Manager — Database Projects          | To \$35,000 |
| IMS DB/DC                            |             |
| Real-Time Projects                   | To \$35,000 |
| 303X + Series 1                      |             |
| Project Manager — Q.A.               | To \$33,000 |
| Supervise 8 Planners and Analysts    |             |
| Unit Manager — Banking Apps.         | To \$31,000 |
| Supervise Product Managers           |             |
| Project Manager — Liteweight         | To \$28,000 |
| TSO/SPF, COBOL, IMS, DB/DC           |             |

State-Of-The-Art  
Search and Placement

(415) 421-1142

## Thomas Beck Inc.

Suite 3033  
595 Market Street  
San Francisco, California 94105

Executive Search for the DP Industry  
Client Companies Assume All Fees

### NEW ENGLAND - FLORIDA TEXAS - MIDWEST

The firms we recruit for comprise the solid, growing, and wise.

#### WE ARE SELECTIVE.

The challenges they offer include advancement, top pay, good locations.

#### WE ARE SELECTIVE.

The skills they've asked us to find: systems programming (all levels/kinds), computer engineering, and applications.

#### WE ARE SELECTIVE.

Please call or write us. You may be a SELECTIVE candidate that way.

### SELECTIVE RECRUITING ASSOCIATES

3001 S. State St.  
Ann Arbor, Michigan 48104  
Phone: 313-994-5632

(Mail or collect calls to C.W. Page)

### SOFTWARE PROFESSIONALS

Opportunity to join a small, elite group of professionals engaged in consulting and product development activities. Our company markets software and services on a worldwide basis, and successful candidates receive high-visibility positions within our growing organization. Applicants should possess a broad background in programming, and experience with both IBM and DEC systems is desirable. Compensation includes above-average salary and bonuses, and a highly competitive benefits package. Please send resume to Mr. Kevin J. Merz:

**etc** ENTERPRISE  
TECHNOLOGY  
CORPORATION

305 MADISON AVENUE  
NEW YORK, N.Y. 10165

## Programmers, The "Challenge Every Moment" People Welcome You To Wescon '80.

While you're in Anaheim for the conference, drop by and visit us. Carter Hawley Hale's Information Systems Division. We're right near by, challenging our data processing professionals every moment as we provide information to a growing and respected retail network. Our prestigious retail network relies on the aggressive information processing efforts of the men and women working in our state-of-the-future ISD facility. As we grow we have ongoing opportunities for:

**Programmer Analysts**  
**Sr. Programmer Analysts**  
**Systems Analysts**  
**Sr. Systems Analysts**

Carter Hawley Hale's Information Systems Division. Join us. We've got the California lifestyle you've been looking for. And we'll provide you with on-the-job challenges every moment. So if you plan to be at Wescon '80, why not come and talk with us? To arrange an interview send your resume ahead, or call Margo Shiroma or Al Quintanilla at (714) 533-9863.

**CARTER HAWLEY HALE STORES, INC.**  
Information Systems Division  
P.O. Box 1075  
Placentia, CA 92670

We're An Equal Opportunity Employer

**CARTER HAWLEY HALE  
STORES INC.**

## On your way to Upstate New York?



*We're the people to see.*

From Buffalo to Albany, from Binghamton to Massena, we're the computer and accounting/financial pros who place the computer and accounting/financial pros. That's what we're known for—and we do it with care, personalism and confidentiality. Contact us first!

**CFA Associates**  
AGENCY PERSONNEL INC.  
Specialized Affiliates Nationwide  
2530 JAMES ST., SYRACUSE, N.Y. 13208 TEL. 315-463-5225  
Member—National Computer Associates (NCA)  
Member—Accounting Financial Associates (AFA)

### SYSTEMS DEVELOPMENT MANAGER AND PROJECT SYSTEM ANALYST

Outstanding career opportunities beginning with participation in the design of a comprehensive, state of the art, management information system. These are new positions in our organization.

As a leading agricultural marketing and exporting corporation (700 million+) with rapidly growing sales, we offer a solid career challenge, excellent benefits, and pleasant surroundings in a South Central U.S. community under 100,000 population.

#### REQUIREMENTS:

- Systems Development Manager**
  - 6 to 8 years experience with direct responsibility for the management of personnel and technical resources in the successful development and implementation of one or more complex systems.
- Project System Analyst**
  - 2 to 4 years background in detail design of state of the art systems in a data base/data communications environment.
  - Strong technical skills in addition to good interpersonal communication skills.

#### PLUSES:

- Univac Experience
  - Formal Technical Training
- We offer competitive salaries based on experience and potential. Submit resume, including salary history and requirements, in confidence, to:

**Personnel Department**  
P.O. Box 3408  
Enid, Oklahoma 73701  
An Equal Opportunity Employer



position announcements

position announcements

position announcements

position announcements

position announcements

## Sr. Systems Programmers &amp; Systems Programmer

## BE A CORPORATE-LEVEL MIS CONSULTANT... AT THE WORLD'S LARGEST PRODUCER OF INTERACTIVE COMPUTERS

Join Digital Equipment Corporation. You'll work with the most advanced systems we produce. You'll have the opportunity to make broad-based systems planning/design contributions to our manufacturing operations worldwide... or to our corporate manufacturing programs in Maynard, Mass. And you'll have plenty of opportunity to grow - within a company that encourages innovative thinking and rewards individual success. All positions offer fully competitive salaries and generous benefits, including 100% tuition refund. Apply now if you qualify.

**PRINCIPAL SYSTEMS PROGRAMMER/CONSULTANT**  
Will provide responsive systems software support to Manufacturing Data Centers, worldwide. Emphasis will be on DECsystem 10/TOPS-10 environment with eventual migration to TOPS-20. Duties will involve providing technical consulting service to DP communities and developing long-range hardware/software strategies. Position requires 2-5 years of solid DECsystem-10 systems programming experience, preferable in a network environment, strong understanding of TOPS-10 monitor internals; hardware/software troubleshooting background; and proven supervisory abilities. Some travel necessary.

**SR. SYSTEMS PROGRAMMER/CONSULTANT**  
Will provide responsive, round-the-clock technical support to Manufacturing Data Center users and staff. Duties will involve ensuring reliability

of 5 DECsystem-10's; monitoring crash analysis and resolution; modifying and enhancing TOPS-10 systems software; and interfacing with other support groups. Position requires 2-3 years of solid DECsystem-10 programming experience. Ideal candidate will have fluency in MACRO-10; strong understanding of TOPS-10 monitor internals; and experience with TECO, KL10 hardware/software, DECnetworks, and new monitor installation and operation.

**SYSTEMS PROGRAMMER**  
(Maynard, MA Data Center)  
Will provide technical support to Manufacturing Data Center. Emphasis will be on TOPS-10 with eventual migration to TOPS-20. Some travel necessary. Position requires 1-2 years of solid DECsystem-10 programming experience; working knowledge of MACRO-10, KL10 hardware/software, TECO, and TOPS-10 monitor and systems program internals.

Call (617) 483-9803 for more details, or send resume, indicating salary history and position of interest to: **Fred Arno, Digital Equipment Corporation, Dept. 3000 36071, 148 Main Street, Maynard, MA 01754.** We are an equal opportunity employer m/f.

**digital**  
digital equipment corporation

## Discover San Francisco's Resources

Consider a career in the beautiful San Francisco Bay Area. If you are an experienced Programmer or Analyst, with a knowledge of COBOL, OS, JCL, ALC, IMS, DATA BASE SYSTEMS and COMMERCIAL APPLICATIONS, contact your best resource and discover your prospects for advancement and high salaries.

Call collect or write.  
Naturally, the employer pays all fees.

**LOGICAL OPTIONS, INC.**

One Market Plaza, Spear Tower  
Suite #2014 C  
San Francisco, CA 94105  
(415) 777-3900

### We are seeking to fill 478 EDP Job Openings in the San Francisco Bay Area

You'll find little evidence of recession in the computer careers market in the San Francisco Bay Area. Growth continues at a rapid and steady pace, with heavy demand at all levels for qualified EDP personnel. Our client companies pay all fees, interview and relocation expenses.

The Computer Resources Group, Inc., is a long-established (9 years), highly respected (150 leading companies utilize our services), and start organization (our data bank of computer professional needs is unmatched in the San Francisco area).

Send us your resume today or call collect.

**COMPUTER RESOURCES GROUP INC.**

303 Sacramento Street, San Francisco, CA 94111  
(415) 398-3535 or 3333 Bowers Avenue, Suite 130  
Santa Clara, CA 95051 (408) 727-1058

AFFILIATES IN 25 MAJOR U.S. CITIES  
An employer-retained professional placement service

# Saudi ARABIA

Saudi Maintenance Company, Ltd. (SIYANCO) has been awarded a contract by the U.S. Army Corps of Engineers supporting the Saudi Arabian Army Ordnance Corps. A significant part of this effort is the continued development of an extensive computer system and its operation throughout the Kingdom of Saudi Arabia.

Hardware consists of IBM System/3 and 370 computer families, both disc and tape, and languages including COBOL, RPGII, JCL and Assembler Language.

Some of our current job openings are as follows:

## SENIOR SOFTWARE PROGRAMMERS

You will be responsible for the technical support of application programming and computer operations by creating, maintaining, modifying and implementing software systems. You will also be required to provide systems software assistance at remote computer sites, as well as central computer facility. A college degree in Computer Science or Mathematics, or equivalent experience preferred; and programming experience with latest IBM software which includes COBOL, RPGII, Power/VS, JCL, DOS/VS, CICS/VS, Assembler Languages, and VSAM is required.

## SENIOR and SITE DATA PROCESSING CO-ORDINATORS

You will provide advice and assistance concerning specialized topics pertaining to teleprocessing/telecommunications, information retrieval systems techniques and advanced programming methods as required. Additionally, you will insure that updates and/or changes to master program are explained, documented and implemented by each site. Experience with Data Base Retrieval, Modular Programming, Mathematical Programming and Programming of Decision Logic Tables and Structured Programming techniques is necessary and ability to program in COBOL and Assembler Languages is required, plus familiarity with Job Control Language and RPGII. College degree in Mathematics or Computer Science or its equivalent along with previous supervisory experience are needed.

## PROGRAMMERS/SYSTEMS ANALYSTS

You should be versed in 370 hardware capabilities currently being utilized with knowledge of applications and modular programming for complex systems designs and must be a proficient programmer in COBOL. Familiarity with RPGII and Assembler Languages, five years cumulative experience in ADP programming and past or current involvement with a sizeable systems programming effort are required. College degree in Computer Science or Mathematics, or equivalent practical experience preferred.

## COMPUTER OPERATORS

You'll be responsible for computer run procedures, preparation and completion of production schedules, maintenance of operation logs, evaluation and recommendation of computer operations and performance of hardware and data media. In addition, you'll maintain inventories of forms, tapes, discs and other supplies, and be accountable for input/output validation, security of data programs, etc. Experience in medium size computers with magnetic disc and tape peripherals and input/output devices and operating systems, one time processing methods and teleprocessing hardware is needed. Basic knowledge of RPGII and COBOL programming is a plus.

We offer 18 to 32 month employment agreements, excellent compensation packages (including bonuses), R&R with paid travel to Athens, annual leaves with travel paid to point of hire, free medical care, free housing, and the opportunity to expand the scope of your professional development with the most modern hardware available anywhere in the world.

To explore these unique opportunities and others in the Data Processing Field, send your resume and salary requirements, in confidence to:

JR Box 269W, Suite 1900  
271 Madison Avenue, New York, N.Y. 10016



شركة الصيانة السعودية المحدودة  
**SAUDI MAINTENANCE COMPANY LTD.**

Saudi Maintenance Company Ltd. (SIYANCO) is a joint Saudi-U.S. owned company which is managed by Americans and is an equal opportunity employer.



position announcements

position announcements

position announcements

position announcements

position announcements

## Computer Operators For Saudi Arabia Offers Rewards On The Job...And Off

Spectra Medical Systems designs and installs minicomputer medical information systems throughout the world. Our systems provide hospitals and medical centers with on-line order entry and management of patient data and services. By working with our users in Saudi Arabia, you can combine a once-in-a-lifetime opportunity to travel, with the satisfaction of contributing to life-sustaining work.

Using Data General computers and peripherals and Spectra's utilities and software, you will set up and terminate systems and perform crash procedures. Experience with Data general, including ECLIPSE C/330, C/150, C/350 and Nova 3 computers and associated hardware is desirable. Familiarity with Data General software and utilities (AOS and RDOS) would also be helpful.

We'll provide you with a superb benefits package including fully paid airfare and travel arrangements, free housing and utilities, and 40 DAYS PAID HOLIDAYS AND VACATION PER YEAR, with \$1,000 "R&R" pay.

Take advantage of this rewarding opportunity with a young, dynamic, rapidly growing company. Send your resume in confidence to: **S. Altstadt, Spectra Medical Systems, Inc., 475 Potrero Avenue, Sunnyvale, California 94086.** An equal opportunity employer m/f.

**SPECTRA MEDICAL  
SYSTEMS, INC.**

A Unit of Whittaker Corp.

## Teleprocessing Trouble Isolation Analyst

Fireman's Fund Insurance Companies', teleprocessing network is growing rapidly, and we're looking for talented professionals to take part in these challenging and exciting times.

To qualify, you should have troubleshooting knowledge of non-switched (point-to-point and multi-drop) and switched networks, test equipment, IBM TP protocols, terminal/minicomputer systems, 3705 operations and the ability to interface with users/vendors.

We offer excellent benefits including staggered work hours, and a generous relocation package. And of course very competitive salaries. For immediate attention to your inquiry, call TOLL FREE anytime: 800-821-2280, ext. 903. If unable to call, send your resume, including salary history to: **Bernie Bernstein,**

Recruiting Consultant, Fireman's Fund Insurance Companies, 1600 Los Gatos Drive, San Rafael, CA 94911. An equal opportunity employer m/f/h. Please, No Employment Agency Calls.



**YOUR  
FUTURE IS AT  
FIREMAN'S FUND.**

### COMPUTER SCIENCE:

Permanent (tentative) position beginning January, 1981 at the instructor, assistant professor or associate professor rank. Salary range: \$14,938 - \$21,988. Duties include teaching 12 credits per semester of undergraduate Computer Science courses beginning through upper level, in an applied Computer Science program; assisting in the development and teaching of new Computer Science courses, advising students, serving on faculty committees, and participating in academic and professional activities. A background in FORTRAN, COBOL, and a block structured language useful, with some specialized experience desirable. **Qualifications:** For instructor - minimum of Bachelor's in Computer Science or related field plus 15 graduate credits; three years teaching and/or data processing experience. For assistant professor - minimum or Master's in Computer Science or related field, plus 10 graduate credits; four years teaching and/or data processing experience; Ph.D. desirable. For associate professor - Doctor's degree or Master's degree plus 40 semester hours of graduate credit in Computer Science or related field; five years teaching and/or data processing experience. Send applications to **Dr. Gerald M. Burke, Chairman, Computer Science Department, Indiana University of Pennsylvania, Indiana, Pa. 15708** by October 17, 1980.

An Affirmative Action/Equal Opportunity Employer

### DATA CENTER MGR. - NH

Major fin'l. serv. org. seeks disciplined & proven mgr. to direct new service bureau facility. IBM 370 OS/VS1 or MVS; on-line & SNA exp. desirable. Will oversee tech support, prod. services & data center security. Long-range growth & recognition offered to goal-oriented pro. Salary \$30,000 range. (Fee Paid) Contact **Gerry Battista.**

**Robert Hall of Boston, Inc.**  
100 Summer Street  
Boston, MA 02110  
(617) 422-1200  
Personnel Consultants

## MIS PROFESSIONALS

### Consider a Career in FLORIDA at COMPUTER PRODUCTS, INC.

We are a growth-oriented electronics manufacturer located in Fort Lauderdale. We are searching for an Information Systems Manager to help us implement and manage new on-line systems on our installed DEC 11/70.

This management position provides challenge and growth opportunity for the right MIS professional. The position is responsible for all facets of information systems including: implementation of systems, management of professional staff members and support for our user departments. Required is a minimum of five years of information systems experience, knowledge of information systems design, a thorough familiarity with financial and manufacturing applications with a broad understanding of hardware and software.

Salary is commensurate with experience; we provide a comprehensive package.

Send your resume and salary requirements to **Computer Products, Inc., CW Box 2384, 375 Cochituate Rd., Rte. 30, Framingham, Mass. 01701.**

CPI is an Equal Opportunity Employer.

PSL

**REAL TIME PROGRAMMER II:** Bachelors in computer science, engineering, or math; one year experience in programming mini computers for real time applications; or any combination of experience, education or training providing working knowledge of FORTRAN and assembler languages; familiarity with structured programming techniques; experience with DEC real-time systems; able to implement, test, maintain and document real-time programs; work without day-to-day supervision. Salary is \$16,264 DOE, application deadline September 22. Refer to 123-29.

**REAL TIME PROGRAMMER IV:** Bachelors in computer science, engineering, or math; experience in programming mini or medium scale computers for real time applications or any equivalent combination of experience, education or training providing working knowledge of FORTRAN, assembler languages and PASCAL; familiarity with structured programming techniques and block structured languages for DEC computers; real-time operating systems experience; able to design, implement, test, maintain, and document real time programs; work without day-to-day supervision; familiarity with data acquisition/telemetry systems and techniques desirable. Salary is negotiable DOE, application deadline September 19. Refer to 124-29.

Personnel Department (123-29) (124-29)  
Physical Science Laboratory/NMSU  
Box 3-PSL  
Las Cruces, New Mexico 88003

An Affirmative Action/Equal Opportunity Employer

Physical Science Laboratory

### UNIVERSITY OF PETROLEUM & MINERALS DHAHRAN, SAUDI ARABIA

The Department of Systems Engineering has immediate openings for faculty positions for the academic year 1980-81, starting 1 September 1980:

#### Academic qualifications and experience:

PHD Degree with emphasis on systems and control, operations research or digital systems preferably with teaching experience. Language of instruction is English.

To apply send complete resume on academic, professional and personal data, list of references, publications and research details, and with copies of transcripts and degrees, including home and office addresses and telephone numbers to:

**University of Petroleum & Minerals  
Houston Office  
2223 West Loop South, Suite 410  
Houston, Texas 77027  
(713) 871-9782**

position announcements

position announcements

position announcements

position announcements

position announcements

# AT DATA ACCESS... The Car You Drive Is Your Calling Card!

A major national expansion program of Data Access Systems, Inc., one of the nation's largest independent data terminal distributors, has created openings for:

- Ⓜ **VICE PRESIDENT SERVICE** (Blackwood, N.J.)  
Position requires very strong background in data terminal service management.
- Ⓜ **EASTERN REGIONAL SERVICE MANAGER** (Blackwood, N.J.)  
A minimum of three years experience in data terminal service management is required.
- Ⓜ **BRANCH SALES MANAGERS**  
A minimum of three to five years sales management experience is required.

Plus, sixteen new offices opening within the next four months will create a number of employment opportunities for:



## Ⓜ 52 SALES REPRESENTATIVES

If you are a dynamic self-starter with experience in the sale of computer terminals, computer peripherals, or time-sharing services, we could be a match. Successful candidates will be involved in the sale, lease, and rental of computer terminals... and will drive a Mercedes Benz 450 SEL, 300 SD, or 300 D Company Car.



## Ⓜ 116 CUSTOMER SERVICE ENGINEERS

These positions require experience on such data terminal products as TI, LS, HP and GE. Applicants should also be highly motivated and task oriented, with technical school certificate or equivalent. Successful candidates will receive complete company training and technical support, along with a Datsun 280 ZX 2+2 Company Car.

Company benefits for all positions include medical plan (100% hospitalization), dental plan, profit sharing, and tuition refund. Openings are available in Miami, Jacksonville, Los Angeles, San Jose, San Diego, San Francisco, Orange County, Houston, San Antonio, New Orleans, Richmond, Cincinnati, Indianapolis, Minneapolis, St. Louis, Philadelphia, Pittsburgh, Albany, Buffalo, New York City, Boston, Hartford, Providence, Chicago, and Baltimore.

Send resume or call Susan Brown at 800-257-7748. (In New Jersey call 800-232-6510.) All replies will be held in strict confidence.

**DATA ACCESS SYSTEMS, INC.**  
P.O. Box 1230  
Blackwood, N.J. 08012

An equal opportunity employer

## DEC SALES ENGINEER

You're a DEC Pro and you know the Digital line inside and out. Your past DEC OEM, field sales or support experience has equipped you to explain, install and reconfigure as well as buy, sell and trade just about the entire DEC hardware line. You're good with words, great with people and ready to make the "Big Move." In short,

**YOU'RE OUR KIND OF PERSON.**

Here's your chance to oversee our entire DEC sales effort worldwide. We'll back you to the limit while offering a compensation package embracing everything from a guaranteed salary to an incentive profit sharing plan. We're ready to move if you are. Call us or rush your resume including salary history and requirements to:

(212) 447-4911

**DATAWARE  
SYSTEMS LEASE, INC.**

30 Bay Street, Staten Island, N.Y. 10301



## Is your job sending you a subtle message?

Probably nobody programmed you to make a left turn instead of going straight ahead at that last crossroads. You thought you were headed in the right direction, but you weren't. It happens. To get where you want to in any phase of EDP, make a stop at Dunhill. We're known for more than just placing people. Anybody can do that. As specialists in EDP, we think it's important to guide candidates to jobs in which they will stay put because they're happy in them. We do this by knowing every detail of what a company expects of a candidate and vice versa. (And all our fees are paid by our client companies). With the Dunhill system for placing EDP professionals... programmers and systems analysts to engineers and marketing people, there is a better chance of no "Dead End".

## Dunhill. The National Personnel System

California 770 B. St., Suite 204, San Diego, CA 92101 (714) 238-1331 □ 235 Montgomery St., Suite 1143, San Francisco, CA 94104 (415) 956-3700 Colorado 1790 30th St., Suite 230, Denver, CO 80202 (303) 444-5531 Connecticut 250 Sargent Drive, New Haven, CT 06511 (203) 582-0511 □ 111 Founders Plaza, Suite 313, East Hartford, CT 06108 (203) 528-4181 Florida 2727 Northwest 43rd, Gainesville, FL 32601 (904) 377-3022 □ 3723 University Blvd. West, Suite 104C, Jacksonville, FL 32217 (904) 731-5566 □ Washington Federal Bldg., Suite 515, 633 N.E. 107th St., N. Miami Beach, FL 33162 (305) 653-2535 □ 874 Eau Gallie Blvd., Suite E, Melbourne, FL 32925 (305) 259-6921 Georgia 310 Lincoln Federal Bldg., Suite 815, 3445 Peachtree Rd., N.E., Atlanta, GA 30326 (404) 261-3751 Illinois 180 N. Michigan Ave., Suite 1700, Chicago, IL 60601 (312) 346-0933 Kentucky 310 Lincoln Federal Bldg., Louisville, KY 40202 (502) 589-4740 Maryland 414 Hungerford Drive, Rockville, MD 20850 (301) 424-3010 Massachusetts 3 Center Plaza, Boston, MA 02108 (617) 227-4620 □ 182 Forbes Rd., Braintree, MA 01944 (617) 848-6326 □ 281 Totten Pond Rd., Woburn, MA 02154 (617) 890-8010 □ 515 People's Bank Bldg., Worcester, MA 01608 (617) 798-0116 Michigan 2500 Packard Rd., Suite 201, Ann Arbor, MI 48104 (313) 973-9955 □ 755 W. Big Beaver Rd., Suite 423, Troy, MI 48064 (313) 362-3115 New Jersey 513 Rte. 10, Livingston, NJ 07029 (201) 992-9660 □ 1280 State Highway 46, Parsippany, NJ 07054 (201) 263-5500 New Mexico 2403 San Mateo, N.E., Suite W2, Albuquerque, NM 87110 (505) 864-6734 New York 600 Old Country Rd., Suite 306, Garden City, N.Y. 11530 (516) 248-6000 □ 535 Broad Hollow Rd., Melville, NY 11746 (516) 293-0055 North Carolina 1 Fairview Plaza, Suite 406, 5950 Fairview Rd., Charlotte, NC 28210 (704) 554-8771 Ohio 1166 Goodale Blvd., Columbus, OH 43212 (614) 794-5303 □ Rockville Plaza Bldg., 1440 Stone Rd., Parma, OH 44134 (216) 398-1660 Oregon 805 S.W. Broadway, Portland, OR 97205 (503) 224-1850 Texas 2222 Burke Rd., Suite 205, Pasadena, TX 77054 (713) 672-4444 Utah 672 Kamecotti Bldg., 10 E.S. Temple, Salt Lake City, UT 84111 (801) 363-5494 Virginia 7011 Backlick Ct., Springfield, VA 22151 (703) 254-6000

## Telecommunications Technician \$20-25K

Complete responsibility for national network, hands on environment. Resp. for design, implementation and maintenance. 3-5 years exp. Dynamic, expanding company, excel. benefits.

Call Mr. Thomas  
201-440-4800

## ASSISTANT DIRECTOR OF COMPUTER SERVICES

Shepherd College is accepting applications for the position of Operations Manager through October 1, 1980. This person schedules and manages the daily operations of the Computer Center. Qualifications: B.S. in business administration, computer science, or a related field; 3-5 years of experience in computer field. Minimum salary is \$15,300 annually. For a complete job description, mail resume to: Personnel Office, Shepherd College, Shepherdstown, WV 25443. Equal opportunity/affirmative action employer.

## SAN DIEGO SYSTEMS SUPPORT MANAGER

We are looking for an experienced manager or supervisor who is a self-starter with strong organizational skills to take over supervision of the Technical Reps Department. Individual will be involved in heavy interface with customers regarding installation and maintenance of hardware and software. Experience with minicomputers is a must. Prefer DEC. Knowledge of FORTRAN required and MACRO 11 preferred. Exposure to hardware for minicomputer background. Must have previous supervisory/management background.

## PROGRAMMER ANALYSTS PL1

Requires a minimum of 2 yrs. experience in PL1 for IBM370. International Graphics is a multi-plant operation with over \$40 million in sales. We specialize in real estate services, computer graphics and book publication. Send resume and salary requirements to:

## INTERNATIONAL GRAPHICS

A Division of Moore Business Forms  
7590 Carroll Rd., San Diego, CA 92121

Equal Opportunity Employer



position announcements

position announcements

position announcements

position announcements

position announcements

## MIS PROFESSIONALS JACOBSEN WON'T LET THE GRASS GROW UNDER YOUR FEET

- VM/370
- IBM 370/148 (2 meg)
- 3350 Disc Storage
- 3420 Tape Drive
- 4341 (2/81)
- DOS/VS-OS/VS1
- IDMS
- Dynam-D
- Dynam-T
- COBOL
- CICS
- PANVALET (on-line)
- Answer II Report Writer

Due to recent expansion of our MIS Department including implementation of new hardware and reorganization by application system functions, we have several openings for aggressive self-starters with some technical expertise in Data Base Systems (IDMS-DB/DC) in the listed areas:

### SR. PROGRAMMER ANALYST

Should have a minimum of 3 years experience within a manufacturing company, preferably involved with MRP &/or shop floor control systems. We are looking for an individual who shows the ability to become a future project leader and be highly involved with the user interface. This position will implement and develop programs in a multi-plant environment. Will encompass approximately 75% systems analysis work and limited coding (ANS COBOL).

### SR. PROGRAMMER ANALYST

We are looking for an experienced Programmer Analyst (2 years minimum) interested in joining our financial and distribution system group. This position, on our MIS staff, is highly involved with marketing, distribution invoicing, order entry, sales forecasting and basic financial systems.

### DATA BASE ADMINISTRATOR

A systems specialist familiar with the design of company Data Bases to assist with the complete conversion from DBOMP to IDMS. Knowledge of COBOL required.

### PROJECT LEADER

Multiple plant environment requires experienced MIS professional to lead in the conversion of current systems to new IBM COBOL and Data Base/Data Communications oriented systems. IDMS Data Base experience a plus.

We offer highly competitive salaries and a complete range of benefits. If you are interested in meeting the challenge of a growing organization and department, please submit confidential resume or call:

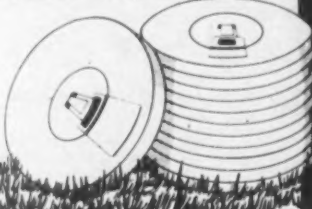
JoAnn Palmer

(414) 637-8711

**JACOBSEN  
TEXTRON**

Jacobsen Division of Tectron Inc.

1721 Packard Ave. Racine, WI 53403  
We are an affirmative action/equal employment opportunity company and encourage females and minorities to apply.



## Systems Engineers Leadership Careers Where You Make The Difference

Storage Technology Corporation is just over ten years old and already the world's largest manufacturer of high density tape storage products and a major manufacturer of disk subsystems and memory products. We've built our reputation on innovative and advanced technology because we encourage the independent, creative contribution of every one of our people. Also, in 1980, we will invest over forty million dollars in R&D, including thin film, LSI and VLSI.

If you are a self-motivated looking for a new challenge, STC offers the opportunity for contribution and individual development not often found with a major corporation. SYSTEMS ENGINEERS with STC consult and provide technical support to field sales and marketing. You set your own schedules and prepare your own presentations. And, we may have a good spot for you right where you are now. To qualify you must possess the following:

- The ability to write and present technical materials clearly and effectively.
- Knowledge of the internals of one or more IBM virtual operating systems (MVS, SVS, VS1, 1M, DOS/VS, DOS/VSE).
- College degree (or equivalent experience).
- Knowledge of any of the programming languages (FORTRAN, COBOL, PL/1), and a high level of proficiency in ALC desirable.
- Ability to learn advanced systems and new software and hardware technology.

### OPENINGS EXIST IN CHICAGO, DETROIT & PEORIA

For fast consideration with absolute confidentiality, send your resume to Fred Moore, STORAGE TECHNOLOGY CORPORATION, 2275 South 88th Street, MD/3-M, Louisville, Colorado 80027, or give him a call TOLL FREE 1-800-825-2840, Ext. 3008, for additional information. We have a lot to say that you'd like to hear!



**STORAGE  
TECHNOLOGY  
CORPORATION**

### PROGRAMMERS

## Technical Translators

If you have a solid background in software or electronics, can translate technical German, and can write good clear American technical English, here's an opportunity you can't pass up.

The job is to translate state-of-the-art technical documentation from German to English. Your tools will include on-line word processors with access to an intercontinental network.

Organizationally, you would be part of our Telecommunications Engineering Division in Cherry Hill, N.J. BUT... you would also belong to Siemens worldwide "Sprachendienst" Group dedicated to making Siemens products marketable around the world.

Interested? RUSH your resume to Derek B. Cross.

**Siemens  
Corporation  
TELECOMMUNICATIONS  
ENGINEERING  
18 Olney Avenue  
Cherry Hill, N.J. 08034**

Equal Opportunity Employer M/F/H/V

### Systems Manager Data Point Installation

Knowledge of programming operations and job control in a Data Point/Data Share environment. One to two years experience. Southern California area.

Contact Joel Sherman  
714/879-8552

## SENIOR PROGRAMMER/ANALYST

Expanded Charlotte, North Carolina data center has on-line system in a multi-division organization providing excellent opportunity for advancement in a professional environment. We need strength in programming and design using modular system development.

### REQUIREMENTS

- 5-7 years ANS COBOL programming
- 2 years hands-on system design
- user interface experience
- project team experience
- experience with UNIVAC 90/80-90/80 or IBM 370 OS
- job control languages
- degree in computer science or related field.

## PROGRAMMER/ANALYST

### REQUIREMENTS

- 2-3 years COBOL programming experience in OS/370 or UNIVAC VS/8 environment
- manufacturing experience
- some experience with analysis and design
- ability to work productively as a team member.

Both positions offer attractive salary, excellent benefits and career opportunity. Send resume and salary history in confidence to:

### REXHAM CORPORATION

Chad F. Mitchell

P.O. Box 4068

Charlotte, North Carolina 28204

An Equal Opportunity Employer M/F/H/V

**Rexham**

### Exeter Associates

NATIONAL RECRUITING CONSULTANTS

BRUCE A. MONTVILLE  
MANAGING PARTNER  
(803) 926-6712



## STILL WAITING?

You can investigate and negotiate towards successful conclusions of any one or more of these attractive career opportunities. We guard your need for confidentiality while providing this service free to you.

- NETWORK COMMUNICATIONS DESIGNER
- MICROPROCESSOR SOFTWARE-GAMES/T.V.
- PROJECT LEADER-MANUFACTURING SYSTEMS
- MANAGER OF PROGRAMMING-3033
- SYSTEMS PROGRAMMING SUPERVISOR
- DATABASE ADMINISTRATOR

For prompt and confidential consideration, forward your resume or call us collect.

(803) 926-6712

P.O. BOX 623, COMPUTER PARK, HAMPTON, N.H. 03842  
A COMPONENT OF EXETER INTERNATIONAL, INC.

### POSITIONS AVAILABLE

**Senior Systems Analyst** — Perm. position with initial assignment as major task leader in dev. of requirements analysis for a statewide judicial information system. Requires B.S. degree, higher degree preferable; 5 yrs. of systems analysis exp., preferably in judicial or criminal justice information system; demonstrated exp. and skills in systems design and documentation; and good oral and written communications skills. Exp. with various levels of judicial personnel highly desirable. Prefer applicants with consulting or management exp. Salary \$27,332-\$33,223. Send resume immediately and no later than September 15 to National Center for State Courts, SEC, NJR, 380 Newport Avenue, Williamsburg, VA 23185. The National Center is an Affirmative Action Employer.

**Systems Analyst** — Perm. position with initial assignment on national-scope information systems project. Performs eval. of system for possible transfer, assessment of and planning for systems development projects, and other analytical tasks within the court environment. Provides tech. assist. to individual state courts and admin. offices. Minimum requirement Bachelor's degree or higher; 1-3 yrs. of systems analysis exp., preferably in judicial or criminal justice information systems; exp. in systems design and documentation; and good oral and written communications skills. Exp. with various levels of judicial personnel highly desirable. Salary \$18,499-\$24,791. Send resume to the National Center for State Courts by September 15, SEC, SVS, 380 Newport Ave., Williamsburg, VA 23185. The National Center is an Affirmative Action Employer.



position announcements

position announcements

position announcements

position announcements

position announcements

# Important Notice To EDP Professionals

## POSITIONS

Programmer Analyst  
Systems Analyst  
Project Leader  
Systems Programmer  
Data Base Analyst/Admin.  
R-T Interactive Distributed  
Software Development  
Mini/Micro Design & Programming  
Micro Code/Firmware Development  
Manager, S & P  
Manager, Tech Support  
Consultants  
Telecommunications, Voice/Data

## INDUSTRIES

Insurance  
Banking  
Manufacturing  
Computer/System Vendors  
Oil & Gas  
Pharmaceutical  
Software/Consulting

We represent over 10,000 quality positions in the great northeast ... including the one you want. And as members of National Computer Associates we can also help you to get to any other part of the country you desire.

Individually and collectively we have built our reputations on ethical and professional service. Candidates of the past are our hiring manager contacts of today.

We are seeking qualified professionals for the positions and industries listed to the left, in state-of-the-art commercial (CICS, IMS, MVS etc.) and other disciplines (graphics, compiler, OPSYS design etc.) **Starting salaries: \$18,000 to \$40,000.**

**Call or send your resume to the listed NCA member nearest you. You have nothing to lose (never a fee or contract) and a big career move to gain.**

### BOSTON AREA

Bob Kieven  
ROBERT KLEVEN & CO., Inc.  
Three Fletcher Avenue  
Lexington, MA 02173  
(617) 861-1020

### HARTFORD & SO. CT

Steve Weber  
COMPASS, Inc.  
900 Asylum Avenue  
Hartford, CT 06105  
(203) 549-4240

### NO. & CENT. JERSEY

Merritt Miller  
SYSTEMS SEARCH, Inc.  
2040 Millburn Avenue  
Maplewood, NJ 07040  
(201) 761-4400

### NYC & L.I.

Jack Talabisco  
BOTAL ASSOCIATES, Inc.  
405 Lexington Avenue  
New York, NY 10017  
(212) 687-0906

### PHILADELPHIA & SO. NJ

Joel Marcus  
SYSTEMS PERSONNEL, Inc.  
207 Fox Lane  
Wallingford, PA 19086  
(215) 565-2920



National Computer Associates

## ONCE IN A LIFETIME OPPORTUNITY KNOCKS NATIONAL SALES MANAGERS (2) NATIONAL PRODUCT SUPPORT MANAGER SALES AND SUPPORT REPRESENTATIVES FOR GRAPHIC ARTS AUTOMATION PRODUCTS IN CANADA

One of the oldest and most respected distributors of printing machinery in North America is now committed to creating a dynamic organization specializing in computerized pre-press systems for both newspaper and commercial printing markets.

Products will include Digital CRT Phototypesetters, Multi-Terminal Editing Systems and Interactive Graphic Display products.

We need an ambitious, aggressive, experienced team to help us meet our goals in growing markets.

For top level jobs, you should have at least 7-10 years of relevant background and know how to build a first-class operation from the ground up. An intuitive understanding of computer systems and intimate knowledge of the printing and publishing are required.

Field sales and support jobs require at least 3 years of relevant experience in the graphic arts, word processing or computer industry, a strong desire to advance, and a willingness to learn. Bilingual capability would be very desirable.

All jobs require extensive travel. Salaries will be top-level, and commensurate with experience. Canadian citizenship or landed immigrant status in Canada are preferred but not required.

Please forward resume with salary history to:

Mr. George Grabie  
Bears Systems Division  
220 Norelco Drive  
Weston, Ontario M9L 1B5  
Canada  
416-748-8129

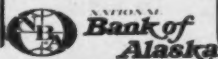
All replies will be held in Confidence.  
An equal opportunity employer.

## Sr. EDP Auditor

This is a hands-on position responsible for evaluating new systems and auditing performance of existing systems in an IBM 370/3031 OS environment. DP auditor experience with IBM OS systems using COBOL and/or BAL, analytical ability, supervisory experience and good oral and written communication skills are required. Banking experience and degree in accounting or DP would be a plus.

The National Bank of Alaska is the state's largest financial institution and offers an excellent compensation package which includes medical, dental, vision, and profit sharing.

Please send resume with salary history to V.F. Garvey, National Bank of Alaska, P.O. Box 900, Anchorage, Alaska 99510. An equal opportunity employer, male/female.



## DATA PROCESSING PROFESSIONALS

Top Companies      Top Salaries

Florida, Mass., Georgia, New Jersey, Maine, N. Carolina, S. Carolina, Conn. You choose the machine and languages. Our professionals do the rest. Call the Data Processing Dept. this week for immediate openings. System Programmers, Project Leaders, Programmer Analysts, Systems Analysts, MIS Directors, D.P. Managers. Call toll free 800-327-7260 or in Florida call 1/305/771-9910 collect or mail your Resume with position and salary requirements to:

COSMO DATA SERVICES  
5301 N. Dixie Hwy  
Ft. Lauderdale, FL 33334

## Operating Systems Team Leader

If you think "point-of-sale" merely means clever cash registers, then there's a lot you should know about POS systems at National:

We are the POS Division of National Semiconductor and in our business we lead — our DATACHECKER products are installed in most of the leading supermarket chains. We build turnkey systems that do the TOTAL job (what you see in the front of a store doesn't tell half the story!)

Right now, we're looking for a very special person to lead the development of a totally new multi-tasking transaction processing operating system. As the key to the development of a major new product line, you'll need at least 6 years of proven successful experience in the development of small/medium scale business-oriented operating systems and related software. You should already have some leadership experience, although we are very flexible on how much, and at least a BS. MS preferred.

If your background resembles the above, and you are looking for a position with outstanding career potential then we'd like to talk with you.

Send your resume, in complete confidence, to  
Nancy McAuliffe, Professional Employment,  
National Semiconductor, P.O. Box 2808, Department 3-51-1, Santa Clara, CA 95051;  
or call her COLLECT at (408) 737-5840.  
An affirmative action employer.

**National Semiconductor**

If you didn't know that, you don't know National.

## DATA PROCESSING PHOENIX-NEW MEXICO-COLORADO-CAL-TEXAS

Our client companies have openings for experienced people in various data processing disciplines. Salary ranges are from \$18,000 to \$35,000 for programmers to project leaders. Call to investigate the opportunities available for your career advancement. Complete confidentiality is assured.

All positions fee paid



PERSONNEL OF PHOENIX, INC.  
1777 W. Camelback  
Phoenix, Az. 85015

Suite M 106  
Phone: 1-800-526-1903

position announcements

position announcements

position announcements

position announcements

position announcements

## we're looking for DP Professionals who Are Ready to Take The NEXT STEP UP

Santa Fe Energy is a  
Great Place to Grow

Energy is where the action will be in the coming decades, and Santa Fe Energy Company will be at the forefront. With operations in Texas, New Mexico, Utah, Wyoming, Montana and offshore Louisiana, we're the nation's fourth largest independent oil and gas exploration and development company. Our parent company, Santa Fe Industries, is one of the nation's largest diversified corporations. In addition to competitive salaries and a chance for real career growth, we offer excellent company benefits including health, dental, life, disability and retirement. Come grow with us.



### Amarillo is a Great Place to Live

Amarillo sits on the northern edge of the Sunbelt, escaping the humid, suffocating summers of the deep south and the bitter cold winters of the north. Anyone who lives here will tell you its sunsets and summer nights are the best anywhere. Its air is still the clean air of the prairie but its surrounding land has been turned into one of the garden spots of the nation.

Amarillo still boasts a western heritage and flavor but its culture, alive with art and music and literature, is a mix of influences from Denver, Dallas, Albuquerque and Oklahoma City, each of which is just a short drive away. And a half-day's drive puts you in the Rocky Mountains near any of four popular ski areas. Its schools, including a university and junior college, are excellent. Housing is inexpensive by national standards, averaging only \$28 to \$32 per square foot for new brick construction. And property taxes are low. The local economy is strong and there is no state income tax. Amarillo is a great place to live and raise a family.

Our installation is an IBM 370/168 6 meg system currently running OS/VS1 with plans to upgrade to MVS this fall. We need people to fill the following positions:

**SYSTEMS ANALYSTS**— Six to eight years experience, the most recent three to four years with IBM OS COBOL.

**DATA BASE ANALYSTS**— Minimum three years experience with IBM OS COBOL.

**PROGRAMMER/ANALYSTS**— Four to seven years experience, the most recent three years with IBM OS COBOL.

**PROGRAMMERS**— Three years experience, most recent one year with IBM OS COBOL.

**DATA BASE TECHNICIANS**— General background DP with one year DP and/or programmer.

**SENIOR MVS SYSTEMS PROGRAMMER**— Minimum two years experience with MVS system generation and maintenance. Working knowledge of COBOL, FORTRAN ASSEMBLER, OS/JCL and utilities required. Experience desirable in data base systems, data communications and computer performance evaluation.



Send resume and Salary history to:  
Personnel Department

**SANTA FE ENERGY COMPANY**

One Security Park • 7200 I-40 West • Amarillo, Texas 79106

Equal Opportunity Employer M/F

## FLORIDA'S ECONOMIC FORECAST... IS BRIGHT & SUNNY!!!

Our client, an internationally respected leader in the design and manufacture of Data Processing peripherals and communications systems is seeking talented men and women with above average skills in the following areas:

- **SOFTWARE DESIGNERS** — One or more years EXPERIENCE DESIGNING, DEVELOPING or MODIFYING OPERATING SYSTEMS, DATA MANAGEMENT SYSTEMS, COMMUNICATIONS SYSTEMS or COMPILERS using ASSEMBLER language.
- **SOFTWARE DIAGNOSTICS** — EXPERIENCE DEVELOPING DIAGNOSTICS for large scale IBM PROCESSORS and PERIPHERALS (disc, tape, printer, etc.).
- **SOFTWARE COMMUNICATIONS** — EXPERIENCE in the areas of CICS INTERNALS using ASSEMBLER language on IBM operating systems.

Salaries are competitive, with outstanding working conditions and liberal benefits programs in addition to the bright and sunny recreational and economic climate of Florida's Suncoast! Please forward your resume, in confidence, or call:

(813) 872-1853



**frank leonard personnel**

1211 N. Westshore Blvd., Suite 100-CW  
Tampa, Florida 33607

Our client is an Equal Opportunity Employer. Client company pays all fees.

### DIRECTOR - COMPUTER SYSTEMS AND PROGRAMMING

Requires B.S. degree, business administration or comp. science, 5 years experience. Management, programming concepts, systems analysis and design. Background with digital equipment essential. Prefer with equipment dealership experience. Duties include total responsibility for equipment and personnel procurement and management, establishment of standards and procedures and monitoring of same, budget accountability and ability to represent company at seminars and other speaking engagements. 40 hours per week. \$40,000/year plus benefits. Resume with references required. Contact: B. Anthony Reed or Don Penwell, EBS Data Processing, Inc. P.O. Box 8688, TA, Denver, Co. 80217; (303) 773-1212; EOE M/F.

### MIAMI-DADE COMMUNITY COLLEGE

Openings exist for experienced computer programmers at the Programmer (IV) level. A Programmer (IV) is usually competent in most phases of systems analysis/programming to work independently in coding, debugging and testing programs. ENVIRONMENT: IBM 370/158 - compatible machine, 4/MB core. Many administrative applications in support of a large, progressive college in a suburban location.

Send 2 copies of detailed resumes to:

Personnel Services,  
11611 S.W. 18th St.,  
Miami, FL 33176.

SALARY: Based on experience. Liberal employee benefit program - \$16,700 - \$24,267.

An Equal Access/Equal Opportunity  
Community College

## EDP SPECIALISTS career search opportunities \$18,000 — \$55,000+

**DIRECTOR RAD SOFTWARE/HARDWARE to \$55,000 PLUS.** Attractively located Mid-Atl corp., most advanced & largest in growing field, seeks exec for KEY Tech group of 35+ pros developing on-line mini-based systems w/multiple custom I/O's. Req's achievements managing software/hardware systems product development. Refer HG.

**TELECOMMUNICATIONS COORDINATOR to \$38,000.** Our major corporate client seeks exp'd telecommunications coordinator w/5+ yrs exp in data communications & data networks to include terminals, communications controller, time division & statistical multiplexers, modems & related diagnostic equipment. Refer BS.

**SOFTWARE SUPPORT ANALYST, \$38,000.** This position involves troubleshooting software problems & identifying weak points in new operating systems. Successful candidate will have exp in identifying software design problems. Refer NS.

**TECH. SUPERVISOR to \$38,000.** Div Hdqtrs/"Fortune 100." Mid-West location. Direct software systems program area. Large IBM state-of-art. Tech supv bkgd. Degree. Refer AT.

**SYSTEMS MGR. to \$34,000.** International corporate operation. Mid-west location. #2 position to direct D.P. staff/training & planning/software assurance/eng business systems large IBM/mini environment. Supervisory bkgd. Degree. Refer AT.

**TECHNICAL CONSULTANT to \$33,000+.** Major consulting firm seeks individual to dvp their tech consulting practice — evaluate hardware, type of operating system &/or performance tools. New Position. Atlanta based. Refer RS.

**SR. SYSTEMS to \$36,000.** Prestigious financial corp in suburban MD seeks Sr. Analyst w/exp in financial/accounting systems. Exceptional growth oppty. Refer RN.

**SR. SYSTEMS to \$36,000.** Billion \$ prestige manufacturing corp in choice VA location seeks Sr. Analyst w/exp in financial, accounting, payroll or inventory areas. Large 370 OS, COBOL, IMS bkgd & plus. Refer DM.

CONTACT OUR NEAREST OFFICE ABOUT THESE AND OTHER  
FREE-PAID OPPORTUNITIES. OUR UNIQUE, COMPANY-OWNED  
OFFICE SYSTEM ASSURES PERSONAL, CONFIDENTIAL SERVICE.

PHILADELPHIA, PA 19102 — J. Burns, 1300 Chestnut St., 215-561-6200  
ATLANTA, GA 30308 — R. Spang, 47 Perimeter Center, 404/253-0923  
BALTIMORE, MD 21204 — R. Nelson, 485 Washington Ave., 201/298-4980  
CHARLOTTE, NC 28202 — J. Schwab, 1742 Southern Bell Dr., 704/275-6800  
CLEVELAND, OH 44191 — A. Thomas, 5755 Granger Road, 216/749-9030  
DALLAS, TX 75201 — D. Miller, 1710 Goodridge Drive, 702/792-1335  
DENVER, CO 80202 — H. Stenitzer, 1211 E. of the Americas, 312/840-6630  
PITTSBURGH, PA 15222 — S. Myers, 4 Gateway Center, 412/232-0410  
PRINCETON, NJ 08542 — J. Dyer, 3400 U.S. Rt. 1, 609/452-8135  
WILMINGTON, DE 19810 — R. Green, 3510 Silverdale Rd., 302/478-5180  
HOUSTON, TX 77058 — G. Smith, 2000 Richmond Ave., 713/523-5054  
LOS ANGELES, CA 90017 — W. Melchior, 707 Wilshire Boulevard, 213/823-3201  
SAN FRANCISCO, CA 94111 — W. Melchior, 601 Montgomery Street, 415/282-4383

**fox-morris**  
personnel consultants

## Senior Computer Research Analyst

We are one of Connecticut's largest and fastest growing commercial banking organizations.

We are currently seeking a Senior Computer Research Analyst. This individual will be responsible for the analysis of our hardware and software systems to insure maximum operating performance and the evaluation, testing, and installation of our operating system and data based software.

Minimum requirements include 4 years' of programming experience, 2 years' of B 8000/7000 DMS II experience and familiarity with ALGOL. Exposure to MCP or DataCom software helpful, but not required.

Please forward resume with salary requirements to:

Personnel Department



**Colonial  
Bancorp, Inc.**

48 Leavenworth Street, Waterbury, CT 06720

An equal opportunity employer M/F

## EXPAND YOUR HORIZONS... DATA PROCESSING, Courtesy of ROTH YOUNG Scientific Programmer

|                      |                          |
|----------------------|--------------------------|
|                      | \$40K- MINI/MICROS,      |
|                      | FORTRAN                  |
| Data Base Admin.     | \$38K- IBM 3031, IMS     |
| Data Base Mgr.       | \$35K- IBM 3031          |
| Project Leader       | \$30K- IBM 4331          |
| Systems Programmer   | \$30K- IBM 331, VSI      |
| Systems Analyst      | \$28K- IBM 370/158, CICS |
| Data Processing Mgr. | \$25K- IBM 370/138       |
| Programmer Analyst   | \$23K- Financial Systems |

ALL Positions FEE PAID

call BILL MILNER

**ROTH YOUNG PERSONNEL SERVICE**  
214-233-6000  
3344 Alpha Rd.  
Dallas, Texas 75248



position announcements

position announcements

position announcements

position announcements

position announcements

## At DTI we hire the best ... and keep them.



## For good reasons.

**The technology.** Digital Technology Incorporated is a state-of-the-art software research and development firm. We create systems to meet extremes in performance, reliability, and security. DTI people work at the cutting edge of software technology in:

- operating systems
- software reliability
- computer security
- formal verification
- network systems
- communications protocols

**The environment.** Our professional working environment is both informal and intense. We demand a lot from ourselves and from one another. Our physical environment supports professional achievement. Everyone has a private office with a terminal, comfortable furniture, windows, and sound insulation. We are an ARPANET node, and our local resources include a VAX-11/780 and a PDP-11/70.

**The benefits.** DTI people get 4½ weeks of vacation per year to start (5 weeks after 3 years), rapid vesting in the retirement plan, full reimbursement of educational expenses, liberal sick leave, plus fully paid insurance for disability, dental care, health, and hospitalization.

**The pay.** The best people are worth more. We pay more.

**If you're a software engineer or technical manager,** with experience in our specialized fields, send us your resume. BS, MS, or PhD required.

### Digital Technology Incorporated

302 East John Street  
Champaign, IL 61820      Attention: R. Newell

Or call 217/364-8500

DTI is an equal opportunity employer.

## SENIOR SOFTWARE PROFESSIONALS

## How to establish yourself as an authority on COMPUTER RETAIL SYSTEMS

Two things are required. Ambition . . . and exposure to all the latest design developments. With 102,928 POS terminals in service around the world, NCR is a top ranking \$3 billion-a-year computer company that is the acknowledged leader in point-of-sale terminals and computerized systems for retail/hospitality applications. We offer association with the top professionals in the field.

We at NCR Engineering & Manufacturing in Cambridge, Ohio are one of NCR's foremost developers of total retail systems. We are expanding so rapidly that we have a wide variety of senior level positions open in our retail software organization. All offer broad exposure to the state-of-the-art. All offer exceptional growing room.

Specifically, we have openings for consulting analysts who can provide technical leadership and expertise. You will determine approaches to compilers, operating systems, and data base efforts, as well as direct complex systems and applications work.

We have positions for Senior Consulting Analysts in Retail Systems Software, Operating Systems and Communications Software . . . who will establish and control overall architecture and design philosophy in these areas and have a significant corporate impact.

And we have openings for Programmer/Analysts with limited software development experience, and for Senior Systems Analysts who will have major roles in developing total POS terminal systems application packages and Software Systems. And, finally for the Retail Applications heavyweight, there's a position that offers major management responsibility.

In short, if you want a chance to make a name for yourself as an authority in any and all aspects of computer retail systems, here are opportunities to do just that. Arrange a thorough briefing on your future with us, and on the uncommon geographical and cost-of-living attractions we offer by sending full, confidential resume and salary history to: Mr. Carl Kline, NCR Corporation, Engineering and Manufacturing, Dept., E50 P.O. Box 728, Cambridge, Ohio 43725.

# NCR

Complete Computer Systems

An Equal Opportunity Employer

## HEAD OF COMPUTING SERVICES

IIASA — the International Institute for Applied Systems Analysis — needs an experienced DP professional to manage and develop its internal computer services and its network connections. The Institute has a Digital VAX 11/780 and several other computers including an 11/70 and two 11/60s. There are network connections to large IBM and CDC computers as well as to TYMNET and TELENET. The operating system is UNIX, on both VAX and 11/70. Support is provided for scientific computing, text-processing, computer conferencing and normal administration.

IIASA is an international, but nongovernmental, research institution sponsored by scientific organizations from 17 nations. It was established in October 1972 on the initiative of the United States and the Soviet Union to bring together scientists from different nations and different disciplines for joint investigation of problems of international importance.

An initial contract of two years is offered, with extension later by mutual agreement. Salary (payable in Austrian Schillings, a hard currency) is free of Austrian taxes and augmented by certain benefits and allowances.

Applicants should have several years experience in a DP service department plus a B.S. in computer science or related discipline. Experience with UNIX based computer facilities is preferred.

Applications, including a typed resume, quoting reference HCS/AML, should be sent airmail to

Dr. R. Levien, Director, IIASA  
Schlossplatz 1, A-2361 Laxenburg  
Austria

**SYSTEM ANALYST/PROGRAMMER, S.S.**  
Degree in Computer Science or equivalent with 2 years experience. To design new and modify existing computerized business applications systems for clients. Interface with clients to solve on spot computer management problems. Must be knowledgeable in COBOL, RPG and the use of Honeywell Level 62 and IBM System 3. \$1832 per month, 40 hour week. Contact Computer Consulting Services, 7915 West Olsen, Houston, TX 77071-1918 Mr. Gray. Equal Opportunity Employer

### Faculty Position

Great opportunity with healthy college; tenure track, rank and salary open, starting January 7, 1981. Duties: teach upper division and introductory computing courses, continue improvement of computing program, consult with academic users of College's PDP 11/45 computing system VAX 11/780 as of March, 1981. Prefer M.S. and/or Ph.D. in Computing or equivalent. Submit application materials (including vita, formal computing courses, 3 letters of recommendation) to: Dr. J.L. Smith, Math and Computing Science Department, Muskingum College, New Concord, Ohio 43762. Deadline: October 16, 1980. EOE



position announcements

position announcements

position announcements

position announcements

position announcements

## PROFESSIONAL ENGINEERING OPPORTUNITIES

Paradyne Corporation has secured a key role in the future world of Data Communications through innovative engineering and design concepts. Our professionals today are continuing our sound successful growth with creative, dedicated approaches to the challenges of tomorrow. We are seeking:

### SOFTWARE DESIGNERS

- Designers working on our IBM 370 front end extenders need experience on 16 bit mini-computers in real time, I/O, handlers, drives and/or systems environment using BAL; IBM systems experience a plus.
- To develop, from inception, our operating system and program Products requires knowledge of operating systems and data management/access method internals using BAL or equivalent large mainframe languages.
- Individuals needed to develop our COBOL compiler for the 370 mainframe must have BAL experience; knowledge of COBOL and internals of a compiler is an asset.
- We need individuals with BAL and 16 bit mini and microcomputer experience; Fortran and bi-sync and/or SDLC protocol experience helpful. Knowledge of modern hardware and interface of terminal equipment also beneficial.

### SYSTEMS ENGINEER - MODEMS

A minimum of 3 to 5 years experience in supporting Field Engineers in installation, maintenance, and troubleshooting Modem networks will qualify you for this in-house position. You will participate with engineering in design reviews, alpha tests, design networks, interface with OEM vendors and handle unique specifications.

As a respected member of our dynamic growth picture, you will receive a salary commensurate with experience, a full benefits package and unlimited growth potential. Please forward your resume, outlining work history and salary requirements, in confidence to:

Steven Hoskins  
Professional  
Recruiter

**paradyne**  
PARADYNE CORPORATION  
8550 Ulmerton Road  
Largo, Florida 33541  
An Equal Opportunity Employer M/F

## Project Manager

### For Our Point-of-Sale Team

Jerrico, Inc. is a Lexington, Kentucky based food service system with operations in 38 states and abroad. Our Long John Silver's Seafood Shoppes and Jerry's Family restaurants make us one of the largest food service organizations in the nation.

An exciting opportunity for a DP professional with 4-6 years analysis experience, including some supervisory exposure. Selected candidate will be responsible for the development of a data base oriented Point-of-Sale System, which will incorporate state-of-the-art techniques and will require innovative thinking. Our shoppe uses COBOL and OS/VS 1 Environment. A degree and a proven successful employment history is required.

We offer excellent opportunities for personal and professional growth, a comprehensive benefit program and competitive salary structure. For fast consideration, call toll free 800/354-9508 or send your resume in confidence to:

Donna Turner  
Jerrico, Inc.  
P.O. Box 11988  
Lexington, KY 40579

**JERRICO** inc.

An equal opportunity employer  
committed to affirmative action.

DATA PROCESSING

## Career Perspective in American Banking

The Federal Reserve System. We work so closely with the Government to insure stability in the American banking system, that some people think we're a branch of the Government. Actually, we're not. We're the bank's bank. We can offer you unique perspective in your career as a computer professional.

If you are an experienced programmer/analyst, systems programmer, data base analyst or a project leader, The Fed has a lot to offer you. To meet our money management goals, we use sophisticated computer applications for everything from pure economic research to electronic funds transfer. The majority of our banks have advanced telecommunications systems using the latest in SNA architecture, state-of-the-art technology (most locations have IBM hardware utilizing IMS) or TOTAL/BI and unique applications development work. Opportunity at The Fed can be found in some of the country's most exciting cities: Boston, New York, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, St. Louis, Minneapolis, Kansas City, Dallas, San Francisco and Washington, D.C.



The 12 districts of the Federal Reserve System.

You'll find competitive salaries, a pay-for-performance merit program, excellent benefits, relocation assistance. And plenty of opportunity for training so you can grow with an organization that's growing to meet complicated economic needs. If you're a computer professional, doesn't it make sense to put your career in perspective with The Federal Reserve System? Call our toll-free number 1-800-821-7700, ext. 103 (in Missouri call 1-800-822-7655) and we'll send you more information. Or, if you prefer, you may send your resume to The Federal Reserve System-DP, P.O. Box 7702, San Francisco, CA 94120. Or, contact any of our Reserve Banks directly. The Federal Reserve System is an equal opportunity employer.

**Federal Reserve System**

## DALLAS

### Banking

Leading institution needs heavy banking applications background. IMS, CICS, TRUST, DOK a plus. Several lead prog/analyst positions open. Salary to high \$20's. Good benefits and relocation pkg.

Suite 1109, Starmon Tower W  
Dallas, TX 75207. (214) 637-6360

**DATA PROCESSING  
CAREERS inc.**

## FT. WORTH

### VTAM Specialist

Variable position, ground floor design effort of disbursed processing network. 3-5 years VTAM/TP experience. Good rate and salary to \$31K.

Suite 911, One Summit Ave  
Ft Worth, TX 76102 (817) 336-4565

**DATA PROCESSING  
CAREERS inc.**

## TULSA

### Technical Support

Major energy companies require extensive MVS support experience in Capacity Planning, Configuration Planning, Performance Analysis, Computer Security, and Communications. Salaries to Mid-\$30's.

2624 E 21st St., Tulsa, OK 74114  
(918) 747-3621

**DATA PROCESSING  
CAREERS inc.**

## KANSAS CITY

We represent the finest clients in K.C. and throughout the Midwest. Outstanding opportunities for Programmers, Analysts & Software Programmers with OS/COBOL, BAL, MVS, CICS or IMS experience. Salary range \$20-\$32K.

6405 Metcalf Shawnee Mission,  
Kansas 66202. (913) 236-8288

**DATA PROCESSING  
CAREERS inc.**

## EDP/MIS Professionals New England/East Coast/ Nationwide

Robert Kleven and Co., Inc. has a wide variety of positions available in programming, Systems Analysis/Design, Data Base Applications, Applications Programming and Software Support for professionals well versed in the field. If your experience covers one or more of the following areas, contact us: Technical Support: COBOL/IMS/CICS/ DOS/OS/VS/ VM/MVS Programming/Design; Assembly or Higher Level Language Programming; Data Base Design/Utilization; Technical Writing.

We've been providing Confidential and Industry-Knowledgeable placement for MIS professionals since 1969. We can also provide you with free resume preparation and career path counseling. Client companies assume all fees. Contact: Simone Zani

**Robert Kleven and Co., Inc.**  
INDUSTRIAL RELATIONS MANAGEMENT CONSULTANTS

Three Fletcher Avenue, Lexington, Massachusetts 02173  
Telephone (617) 861-1020

Member  
Massachusetts Professional Placement Consultants  
National Computer Association  
Offices Nationwide  
Representing Equal Opportunity Employers M/F

## ADVANCEMENT OPPORTUNITIES (NATIONWIDE — CONFIDENTIAL — FEE PAID)

Hundreds of listings — ALL LEVELS — top companies, all sizes, all industries.

(Starting salaries \$18,000 to \$40,000. Companies pay fees and expenses.)

Senior System Analysts  
Programmer/Analysts  
Application Programmers  
System Programmers  
EDP Auditors  
Hardware/Software Analysts  
Mini/Micro Professionals



For more details, send your resume, or call:  
**Mark Fuller**  
**CADILLAC ASSOCIATES, INC.**  
32 W. Randolph St., Chicago, IL 60601  
(312) 346-9400

## APPLICATION PROGRAMMER/ANALYST \$20-25K

3-5 years exp. with minis, preferably with HP1000 or Tandem

Maintain on-line information service; work on conversion of system from HP1000 to Tandem Computers and work on new programs as required. Dynamic, expanding company, excel. benefits.

Call Mr. Thomas  
201-440-4800

## DIRECTOR OF DATA PROCESSING

Death of Director creates immediate need for a person responsible for management of a staff of 35 people in a 270/3531 shop.

Position requires strong manager, at least 15 years in data processing and minimum of 5 years as shop manager. Bachelor's degree minimum.

The company is a 50 year old publicly held company with headquarters in a suburb of Kansas City. Excellent starting salary and growth potential. Send resume with salary history to:

CW Box 2385  
375 Cochituate Rd., Rte. 30  
Framingham, Ma. 01701

position announcements

position announcements

position announcements

position announcements

position announcements

## SOFTWARE DEVELOPMENT OPPORTUNITIES

SYSTEMS ENGINEERING LABORATORIES is a vigorously growing manufacturer of state-of-the-art 32-bit mini-computer used in high-performance real-time applications. The following career opportunities are available due to SYSTEMS tremendous growth in a sophisticated technological environment.

### SUPERVISOR OF COMPILER DEVELOPMENT

Position will carry responsibility for the implementation of all corporate language implementations, including FORTRAN, COBOL, PASCAL, BASIC. Supervisory and planning ability is required. The successful candidate should have built two or more complete language products including all documentation. In this Senior position, the candidate will participate in new product definition in an engineering organization, and interface with the marketing organization to supply data for the corporate product planning and merchandising functions.

### COMPILER DEVELOPMENT STAFF MEMBERS

Individuals selected will have experience in coding, testing, and developing compilers and language products. These positions will offer the opportunity to provide technical leadership as the in-house consultant in compiler development.

### SOFTWARE SUPPORT ANALYST

This position involves troubleshooting software problems and assisting customers in installing new software packages. The successful candidate will have experience in identifying software design problems or misapplications of software on both the operating system and application level. Background in real-time operating systems is a requirement. The ability to interface with both customers and development engineering is an absolute necessity.

### SOFTWARE TECHNICAL WRITER

Dynamic, growing software writing group needs a highly-motivated software writer with background in operating systems, communications, data base management, and/or a language such as ASSEMBLER, FORTRAN, MARY2, PASCAL or COBOL. As an integral member of a product programming team in the Software R&D organization, you will be responsible for producing reference manuals, user's guides, technical manuals, pocket cards, and other literature for that product. You will have the support of the software writing group and in-house word processing, art, and printing departments in this capacity. Substantial writing samples are required. Excellent opportunity for individual with 4 or more years experience in computer-related technical writing who is seeking responsibility and challenge.

### DIAGNOSTIC PROGRAMMERS

Requires 2+ years experience in either communications, I/O or CPU diagnostics.

We offer competitive salaries, comprehensive benefits and the opportunity to make a personal impact in a totally state-of-the-art environment. For confidential consideration, send your resume or letter of information to Fred Brillante.

5901 W. Sunrise Blvd.  
Ft. Lauderdale, Florida 33313

## SYSTEMS

ENGINEERING LABORATORIES

We Are An Equal Opportunity Employer, Male/Female/Handicapped

Ariz./Calif./Texas

### SCIENTIFIC PROGRAMMERS

All Fees Paid \$15-\$35,000

If you have a BSCE, BSCE, BS in Physics or equivalent, we have many openings in Arizona, California, Texas, and Florida.

Your name, resume & present employer will not be given out without your permission.

For sincere personal service, please send a confidential resume to:

Don Pullman - (802) 274-8880

**PULLMAN PERSONNEL**

3003 N. Central, Suite 1708  
Phoenix, AZ 85012

Ariz./Calif./Texas

### BUSINESS PROGRAMMERS

All Fees Paid \$15-\$35,000

Prog/Anal/Systems

Data Base

BAL/COBOL/ASSEMBLER/FORTRAN

OS/DBS/MS/NTS/JES II

"One to One" Service. Many openings in Arizona, California, Texas, and Florida.

Your name & present employer will not be given out without your permission.

If you want to talk about your future, send us a confidential resume at no obligation. We won't waste your time.

Don Pullman - (802) 274-8880

**PULLMAN PERSONNEL**

3003 N. Central, Suite 1708  
Phoenix, AZ 85012

## Data Processing Professionals

What's a leading international bank like Irving Trust doing at One Wall Street?

### PLENTY

And if you're a data processing professional... there's plenty of exciting challenge for you here, too. Opportunities exist in a multiple 370/168, 3033, OS/MVS, IMS, DB/DC environment.



### TECHNICAL SERVICES

We are assembling the industry's most select team of specialists to develop systems for our extensive next generation product line... an advanced capability to provide our customers worldwide with direct and immediate access to critical information contained in our highly centralized data base and communications systems.

- Data Base Administrators
- Performance/Capacity Planners
- Systems/Software Programmers
- Telecommunication Software (VTAM/NCP, VSAM INTERNALS, SMP/RACS)



### APPLICATION SERVICES

Members of this group have the personal attributes to closely interface with users and possess sound technical expertise in Data Processing. Project team concept is emphasized with current assignments in areas of foreign exchange, securities, DDA and wholesale banking among others. Minimum 2 years OS/JCL experience required. IMS batch/on-line and financial applications preferred but not mandatory. Some positions offer overseas travel.

- COBOL/BAL Programmer Analysts
- MINICOMPUTER Programmer Analysts (COBOL, RPG/II or Assembler on any mini-hardware)

And you won't find many places as conducive to personal and professional creativity and growth as you will at The Irving... located at the heartbeat of the banking system, One Wall Street. When you explore a position with us, you'll find that our data processing staff plays a key role in making The Irving a more than \$17 billion corporation with the 4th largest international correspondent banking business in the U.S. That's why our offer of a substantial career is a reality. Salary and benefit program are unquestionably more than competitive.

For an exploratory discussion by phone CALL ME COLLECT: Val Condina, EDP Recruiter, at (212) 487-4896 or send resume to: Val Condina, Irving Trust Company, Dept. CW088 One Wall Street, New York, New York 10015



**Irving Trust**

An equal opportunity employer M/F

### OR CONSULTANT BANKING

If only the BEST will do, this newly formed subsidiary of one of the TOP banks in the country may have what you've been looking for. Aid in development and sale of client engagements with over-all management responsibility for consulting services to all BANKING clients. 6+ years D.P. consulting with heavy background in banking and strong technical experience. \$52,000

### DP MANAGER SYSTEM 38

Manage conversion from SYSTEM 3/180 to SYSTEM 38. 3+ years data processing management experience with strong RPG II and COB experience. Total responsibility for all DP functions with staff of 10. Reports to V.P. Finance. \$40,000

Call: MARTY AMATO

ALL FEES PAID

**ROBERT HOLF**

OF NEW YORK, INC.

625 Fifth Avenue

New York, N.Y. 10019

212-221-4998 (agency)

## If there is a recession, It isn't in Florida!

Software, Devel, Pascal, Ada, C ..... to 40K  
Communications Specialist, Data, Voice ..... to 40K  
IBM Software, Tech Support, Data Base ..... to 35K  
Manufacturing Analyst Programmers ..... to 35K  
Real-time Programming, minis, micros ..... to 35K  
Programmers and Analysts, COBOL, BAL ..... to 30K

..... and less experience too, from entry thru the 20s

To explore these and other D.P. opportunities in Florida and throughout the SUNBELT, send your resume to, or call COLLECT:

David Strasberg / 305-434-6112

Data Sciences Personnel, Inc.

P.O. Box 8577, Hollywood, Florida 33024

**DATA SCIENCES PERSONNEL, INC.**

A MEMBER OF NATIONAL COMPUTER ASSOCIATES



position announcements

position announcements

position announcements

position announcements

position announcements

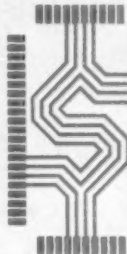
## SNA Systems Programmers

Bank of America is expanding the capabilities of its large network of branch computing facilities. We are seeking top professionals to play a leading role in this effort.

The network will be SNA with Multiple system/370 IMS host systems. You will develop software for over 1000 remote computers. The terminals include 10,000 CRT's and an expanding network of Automated Teller Machines (ATM). Programmable controllers are employed.

You should have a broad background in these areas:

- Communications programming for SNA/IMS
- System generation problems/solutions
- Maintenance of software for multiple systems



- Mini-computer environments
- MACRO-11, PL/I, COBOL, Pascal

Specific knowledge of at least one of the following is required:

- SNA (IMS-SLU-P)
- Bunker Ramo Banktran, ATM
- IBM 3600, 8100

- Burroughs CP9500, NDL, MCS

A B.S. Computer Science will be considered a plus. Salary will be commensurate with your experience. Benefits are excellent. You will work in metropolitan San Francisco which offers a wide range of cultural and recreational activities.

If this opportunity interests you, please send your resume and salary history to Bank of America, Charles B. Smith, Dept. 3411N, P.O. Box 37000, San Francisco, Ca 94137. We are an equal opportunity employer.

**BANK OF AMERICA**



## ADVANCED SYSTEM PRACTICES CONSULTANTS

Leading international public accounting and consulting firm seeks experienced personnel with expertise in advanced systems and data processing skills. The positions are in the World Headquarters research and consulting group. Responsibilities include consulting with our personnel and clients on high technology engagements and conducting research in advanced system practices. Candidates should have substantial (4-5 years) technical experience with credentials in one or more of the following areas:

- Detail knowledge of CICS with ability to generate CICS and do performance timing.
- Detail knowledge of IMS DB/DC and thorough understanding of logical and physical design.
- Data communications with a detailed knowledge in communications hardware and experience with IBM's SNA.

Candidate must have a college degree, preferably in computer science, MIS, business or engineering. Demonstrated technical skills must be combined with exceptional written and verbal communication skills.

Starting salary will be from high \$20's and up, depending on qualifications plus relocation. An opportunity for rapid advancement exists in our organization, with a full employee benefit plan available.

Respond with qualifications and cover letter to:

CW Box 2385  
375 Cochituate Rd., Rte. 30  
Framingham, MA. 01701  
An Equal Opportunity Employer

### SALES/COMPUTER

Dynamic market place demands coupled with the increasing recognition of our innovative microprocessor based terminals has enabled Beehive International to sustain its ambitious growth plan.

This rapid growth is creating career opportunities throughout the organization and especially within the sales force. Specifically the following positions require energetic persons desirous of joining a young company in an exciting high technology environment.

#### SALES PERSON

The successful applicant should have a minimum of 2 years experience in micro or mini computer sales. A B.S.E.E. degree is desirable but not necessary. Experience with Burroughs or IBM 3270 terminal products helpful.

#### SALES/APPLICATIONS ENGINEERS

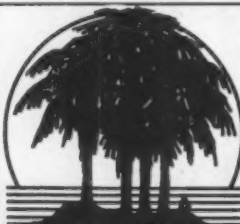
The successful applicant will have an associate degree and electronic technology or comparable military training and 1-5 years experience. Microprocessor, Burroughs, IBM 3270 background helpful.

Beehive International offers an attractive compensation package. For confidential consideration submit resume including salary history to: Personnel Department, P.O. Box 25668, Salt Lake City, Utah 84125.



**BEEHIVE INTERNATIONAL**

equal Opportunity Employer M/F



### CALIFORNIA

If you are interested in relocating to CALIFORNIA, call the West Coast's largest firm devoted exclusively to employment services for the Computer Professional. Our staff is composed of former DP Managers and Software Specialists, well-equipped to understand your special needs. You may call us collect.

#### COBOL PROGRAMMERS

Computer services firm needs Programmers & Programmer Analyst to participate in system/customer support & development of new on-line applications. This is a multi-3033 MVS installation utilizing IMS, CICS, TSO & JES III. The company offers in-house training on IMS, CICS, TSO, JES III, & Structured Programming. Requires 1-5 years experience COBOL Programming or systems design on any large frame computer 360/370 OS or DOS, Univac 1100, CDC Cyber, Honeywell, etc. (Non-citizens with green card are welcome.)

#### CUSTOMER SUPPORT to \$26K (Grow into Supervision)

Will be responsible for O/S generation of RSTS-E or RSX-11 at customer sites for Support of Marketing Business Applications using entire DEC PDP-11 line. Requires 2 years experience.



3303 Harbor, C-10  
Costa Mesa, CA 92626  
(714) 979-7666

HOME FEDERAL SAVINGS & LOAN ASSOCIATION a San Diego based, \$4 billion Association, is expanding and is currently seeking a Computer Professional in the following area:

### SYSTEMS ANALYST

Requires an individual with strong systems analysis experience, project management abilities, excellent user communications and the ability to modify new and redesigned systems. The ideal applicant must have consumer installment lending experience and indirect experience on large scale IBM equipment, MVS, CICS, IMS, and on-line systems design.

#### Excellent benefits

Please send resume in confidence to:

Kay C. Kenyon  
Management Employment Officer

**HOME FEDERAL SAVINGS & LOAN ASSOCIATION**  
P.O. Box 2070  
San Diego, CA 92112

An Equal Opportunity Employer M/F/H

### SOFTWARE TECHNICIAN

High school graduate, minimum 6 months formal, vocational, technical or equivalent training. One year experience on the job or 2 years in computer programming and data processing. Test programs; trouble shooting and debugging; coordination for installation of new programs on IBM-OS, IBM-COS, CDC, and UNIVAC; maintenance of lease program tapes; patching, converting programs, writing technical reports, establish tape library. 40 hours per week, \$1350 per month. Send resume to Dr. R.C. McFarlane, Vice President, Scientific Software Corp., 632 Seventeenth St., Denver, CO 80202. (303) 571-1111.

**THIS SPACE FOR HIRE.**

[Inquire at Classified Advertising Dept.]

### APPLICATIONS PROGRAMMER ANALYST

Work in growing information systems division of 452 bed community hospital located in central California. Beautiful recreational area near 3 national parks. Department plans include sophisticated on line distributive processing with DEC-20 and PDP-11 series. Programming languages include MACRO, COBOL, and FORTRAN. Applicants should have at least 2 years programming in business and hospital applications. Send resume and salary requirements to:

Personnel Dept.  
Fresno Community Hospital  
P.O. Box 1232, Fresno, CA 93715  
209/442-6000, ext 3712.  
An affirmative action, equal opportunity employer.

## ROBERT HALF

**PACIFIC NORTHWEST**  
Washington, Oregon, Idaho & Alaska

### PROGRAMMERS/ANALYSTS

Do you have 1+ years experience in business applications? Do you plan to visit or relocate to this area?

If so, we can arrange interviews for you. Call us collect or send your resume and itinerary and we will get right to work.

Ray Magill, CDP  
ROBERT HALF  
of Seattle, Inc.  
1301-5th Avenue  
Suite 2626  
Seattle, Wash. 98101  
(206) 624-9000

Bob Clawson  
ROBERT HALF  
of Portland, Inc.  
1 SW Columbia  
Suite 650  
Portland, Ore. 97258  
(503) 222-9778



position announcements

position announcements

position announcements

position announcements

position announcements

## Dallas System Software Personnel

Billion dollar electric utility company with centralized data center has immediate need for persons within the rapidly expanding corporate Information Services Department to test and install new or modified systems software.

Positions at multiple levels offer growth potential for professionals demanding challenge and opportunity. Present staff expanding to support installation of second 3033 with **MVS/SPI and 2** as well as 4300 distributive process network.

Present state-of-the-art IBM 3032 environment is **MVS/SE2, ACF/VTAM** with 600 CICS, ROSCOE, and TSO terminals.

Mail resume and salary history to Employee Relations Division, Management Recruiting Department.



**Central and South West Corporation**

2700 One Main Place • Dallas, Texas 75250

Equal Opportunity Employer

## MANAGER SOFTWARE QUALITY ASSURANCE

CRYOVAC, a leading producer of plastic packaging systems, is seeking a Manager of Software Quality Assurance at the division headquarters within the Greenville-Spartanburg metropolitan area of South Carolina.

The individual selected for this position will be responsible for developing quality standards and procedures for all areas within M.I.S. to include operations, technical services, systems and programming and data base administration.

A degree is preferred, along with a minimum of 5 years experience in programming and systems analysis. An additional requirement of this position is a knowledge of operating systems software and on-line application.

CRYOVAC offers an excellent compensation and benefits package and provides the opportunity to develop professionally with an expanding company. If you would like to join our progressive team, please send your resume and salary history in confidence to:

**CRYOVAC**

**DIVISION W. R. GRACE & CO.**  
P.O. Box 464 Duncan, South Carolina 29334  
An equal opportunity employer, M/F

## EXECUTIVE DIRECTOR OF COMPUTING FACILITIES NORTHERN ILLINOIS UNIVERSITY

Northern Illinois University, a state supported university of approximately 25,000 students about sixty miles west of Chicago, invites applications for the position of Executive Director of Computing Facilities.

The Executive Director of Computing Facilities reports directly to the President and has overall responsibility within the computing area for all instructional, research, and administrative functions, for facilities development and utilization, for long-range planning, for budget development and for advancement of the President and his staff on major computer issues.

Computing Facilities, with a professional staff of ninety, a budget of 4.1 million dollars and an Amdahl V7A operating under M.V.S., is comprised of three divisions: Systems and Operations, Academic Computing Services, and Administrative Computing Services.

Applicants should minimally have a Master's Degree in an appropriate field, demonstrated technical expertise in current hardware and software, experience and demonstrated skills in management of large-scale computer facilities, preferably in an academic environment. Salary is competitive and commensurate with experience.

TRANSMIT APPLICATIONS BY: October 1, 1980 to:

Clyde W. Kimball, Chair  
Executive Director Search  
President's Office  
Northern Illinois University  
DeKalb, Illinois 60115

Northern Illinois University is an Equal Opportunity/Affirmative Action Employer

## Software Engineering Opportunities for Computer Scientists & Engineers

Openings in Dallas and Lewisville, Texas  
U.S. citizenship required.

Join Texas Instruments in the heart of the Sunbelt. You could work in Dallas, TI's hometown, or just north of Dallas in Lewisville, a growing community of 30,000. Live better in Texas, where cost of living is below the average of major U.S. cities and where there is no state income tax.

Work with real-time software applications for mini/microcomputer-based systems and on distributed computer architectures and uni-processor systems.

### Application areas include:

- Computer-assisted photo interpretation
- Airborne FLIR tracking and fire control systems
- Ground and air launched missile tracking and guidance systems
- Air traffic control support systems
- Image processing
- Military and commercial communications navigation systems
- Computerized voice encoding/recognition
- Hardware architecture development support
- Advanced radar systems
- Real-time signal processing

### Test Support Software Development

- Automatic test equipment
- Hardware diagnostics
- Automatic test generation
- Software unit test system

### Systems Development and Operations Management

- Distributed computing system applications
- Operating system utilities: development and configuration management
- Resource utilization and management systems

- User consulting/system analysis/system engineering
- Engineering/management support systems
- Data communication applications

### Languages

- Assembly
- FORTRAN
- PASCAL
- JOVIAL
- ATLAS (test support language)
- ADA
- Other higher order languages PL/I, BAL

### All phases of software development

- Top-level software system definition
- Program design
- Code implementation and test
- System integration and test (factory and field)

### Special openings in the following areas:

- Software management
- Distributed data processing system/architecture design
- Software training: languages, design procedures, computer architectures
- Compiler development
- Functional analytic simulation

Applicants should have a BS, MS or PhD in Engineering, Computer Science or related field.

### Software Configuration Managers

Exciting ground-floor opportunity exists today for experienced software configuration managers. Candidates should have a BS/MS and a minimum of 3-5 years' related experience in software development for military contracts. Applicants should have a successful record in both the planning and implementation of software configuration, and be familiar with MIL-STD-1679, MIL-STD-483 and MIL-STD-1521A.

Send your resume in confidence to: Ed Haynes/P.O. Box 401628, Dept. 137/Dallas, TX 75240.

## TEXAS INSTRUMENTS INCORPORATED

An equal opportunity employer M/F

## Project Manager

Our Bay Area client has an excellent opportunity for an EDP Project Manager. The successful candidate's background should include:

- Strong leadership skills
- The ability to communicate — both verbally and in writing to all levels of management.
- Knowledge of Banking or Manufacturing Applications and Time Sharing Applications.
- Good working knowledge of COBOL, ALGOL or FORTRAN.

This position offers an excellent salary and compensation package.

We are consultants to management. For immediate and confidential consideration, send resume and salary history to Cissy VanBalen, Professionals for Computing, Inc., One Maritime Plaza, Suite 1350, San Francisco, CA 94111, (415) 956-7120. Employer assumes fee.

**professionals  
for computing, inc.**  
Search & Personnel Services

## SUPERVISOR SYSTEMS & PROGRAMMING

WABCO, Fluid Power Division of American Standard, has a challenging opportunity for the qualified systems and programming professional.

The successful candidate will be responsible for the supervision of the systems and programming activities, as well as providing technical guidance, in an RJE environment.

To be qualified you will possess strong technical skills in assembler, ANS COBOL, MVS, OS, JCL and DB/AMP or other database systems in a manufacturing environment. The candidate should also possess good communicative skills and previous project leader or related supervisory experience.

A college degree and previous experience with the implementation of MRP and related manufacturing control systems is desirable.

For immediate consideration please send your resume in confidence to:

**WABCO Fluid Power Division  
American Standard  
1953 Mercer Rd.  
Lexington, KY 40505**  
An Equal Opportunity Employer, m/f.

## PROGRAMMERS AND ANALYSTS

### Free Employment Service

### Northeast, Southeast & Midwest U.S.

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support. Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees.

**RSVP SERVICES, Dept. C,  
Suite 700, One Cherry Hill Mall  
Cherry Hill, New Jersey 08002  
(609) 667-4488**

**RSVP SERVICES, Dept. C  
Suite 300, Dublin Hall  
1777 Watton Road  
Blue Bell, Penna. 19422  
(215) 629-0595**

### RSVP SERVICES

Employment Agency for Computer Professionals

position announcements

position announcements

position announcements

position announcements

position announcements

## Computer Professionals

Rensselaer Polytechnic Institute, a prestigious, technologically oriented private university located in beautiful upstate New York is expanding its network of timesharing terminals and distributed mini/micro computers using the IBM 3033 system. We are conducting a search for experienced individuals to actively engage in the following areas:

### Network and Communications Specialist

Will participate in the design, implementation, and support of a communications network using "ether" and X.25 technologies, using the IBM 3033 as one of several hosts. Previous communications and network design experience is required.

### Systems Support Specialist

Will enhance and support major areas of the 3033 operating system and related software. Prior experience with the internals of an operating system is required.

### Compiler Specialist

Will enhance and support compilers, interpreters, and multi-language support systems for use on the IBM 3033. Prior experience with compilers is required.

### Graphics and Applications Support Specialist

Will enhance and support major new applications systems using the IBM 3033. Previous experience with graphics software and with applications package support in a university environment is desirable.

### Database Support Specialist

Will enhance and support the SPIRES database system on the IBM 3033. Previous experience in the design or support of database systems is required.

BS degree and 2 years experience in related area required. Academic experience desirable.

RPI offers salaries commensurate with experience and a complete benefits package which includes advanced educational opportunities.

For immediate consideration, interested and qualified applicants should submit resume, three professional references and salary requirements to:

Thomas F. Molloy  
Employment Manager  
Rensselaer Polytechnic Institute  
Troy, New York 12181



**Rensselaer Polytechnic Institute**

Equal Opportunity/Affirmative Action Employer

## SYSTEMS ANALYST

### Engineer

Burns & McDonnell, an architectural/engineering firm located in Kansas City, Missouri, is in search of an individual to provide user support, technical evaluation and development of structural and mechanical design and analysis of computer programs. Must have BS in engineering with experience in theory and application programming of structural and piping programs.

Send resume to Doug Petersma.

**Burns & McDonnell**  
Engineers - Architects - Consultants

P. O. Box 173, Dept. 218  
Kansas City, Mo. 64141

Equal Opportunity Employer

## SAUDI ARABIA & EUROPE

Challenging 18-24+ months assignments with small expanding Computer Consulting firms, on advanced systems design & installation, for Programmer/Analysts with 2+ years IBM-OS/TSO/CICS/IMS/COBOL and/or HP-3000, S-34 etc. Base salary \$24-40k.

SAUDI Assignments include: 5 weeks vacation and free air-fare-home each year; plus free medical and furnished housing (single/family). For Sept/Oct interviews, & Oct-Dec start-dates, send resume to: **Harvey Poenack & Assoc., 10500 Rockville Pike, Rockville, Md. 20852 (301) 493-4022.**

## Phoenix

Atlanta, Dallas, Houston, Miami

All data processing professionals interested in any sunbelt location, call or send resume to:

**PROFESSIONAL CAREER CONSULTANTS**  
7001 East Presidio  
Scottsdale, Arizona 85254  
(602) 274-6666

Salaries starting from \$22K. Industry is growing fast.

### SYSTEMS ANALYST OPENING CITY AUDITOR'S OFFICE

City of Lowell, Mass.  
Responsibilities will include directing all computer and peripheral machines operations, software maintenance, new software development, providing user departments with computer output, and controlling inventory requirements of the computer operation. It is essential that this individual interface well at all levels of management and is capable of structuring an effective and responsive production control and end product distribution function.  
MINIMUM REQUIREMENTS: Knowledge of computer and peripheral operations, ability to code and maintain COBOL, develop systems, an understanding of full operating systems, database management, virtual systems and direct accessing techniques. Send resume to: James T. Kennedy, City Auditor, City Hall, Lowell, MA 01802 on or before Sept. 29, 1980.

# MARK IV

## PROGRAMMER / ANALYSTS

**SRZ SOFTWARE SERVICES, INC.**, the national leader in MARK IV consulting, has openings for experienced programmers and analysts skilled in design and development of MARK IV or MARK IV/IMS systems. Permanent full time positions are currently available in:

- NEW YORK/NEW JERSEY
- BOSTON/CONNECTICUT
- CALIFORNIA/ILLINOIS
- TEXAS/OKLAHOMA

Our very competitive salaries are enhanced by bonuses, company paid medical, life & long term disability insurance, tuition refund, and a liberal expense policy. If you are interested in a career as a professional consultant please send a resume or call us collect:

**JIM DODD**  
SRZ Software Services  
61 North Maple Avenue  
Ridgewood, N.J. 07450  
(201) 444-9800

**TONY LAMIA**  
SRZ Software Services  
50 West Hillcrest Drive  
Thousand Oaks, California 91360  
(805) 497-8975

**STEVE COMEAU**  
SRZ Software Services  
The Jenney Building  
Route 101A Amherst  
New Hampshire 03031  
(603) 882-6234

**JACK HEMPSTEAD**  
SRZ Software Services  
3329 Crossbend Road  
Piano, Texas 75023  
(214) 867-0030

Note: Additional considerations made to those who are capable of extended or frequent travel.

## FINANCIAL SOFTWARE CONSULTANT

Leading international public accounting and consulting firm seeks an experienced user-installer of large scale IBM 370 general ledger application software. The position is in the World Headquarters software research group in Chicago. Responsibilities include monitoring package status of various vendors, evaluating new packages and releases and assisting our personnel and clients in evaluating and implementing application software.

Candidate should have an MBA or MS in computer science or a bachelor's degree with an accounting major. A minimum of 3-4 years experience in accounting systems including substantial recent package implementation is required. Demonstrated technical skills must be combined with exceptional written and verbal communication skills.

Starting salary will be from mid \$20's and up, depending on qualifications plus relocation. An opportunity for rapid advancement exists in our organization, with a full employee benefit plan available.

Respond with qualifications and cover letter to:

CW Box 2384  
375 Cochituate Rd., Rte. 30  
Framingham, MA. 01701  
An Equal Opportunity Employer

## NEW HARDWARE—NEW OPENINGS EXPANSION CREATED OPPORTUNITIES

Abbott Laboratories, one of the world's leading health care corporations, is seeking several Sr. Programmers and Sr. Systems Analysts to join our MIS Division which is expanding to keep pace with our phenomenal international growth. We've just upgraded our IBM 370/158MP complex to include an IBM 3032 and a 4331. Additional 4331's and 8100's are already on order. If you're looking for a steadily expanding environment that offers outstanding long term potential, look at Abbott.

These senior level positions involve order entry processing, materials management and related applications in an on-line data base environment. At least 3-5 years experience that includes COBOL, OS/VS JCL, CICS, IMS, MARK IV, Project Management Methodologies or Distributed Data Processing is applicable. A degree or equivalent experience is also required.

Abbott offers a highly competitive salary and full benefits including relocation assistance, cash profit sharing, comprehensive life, dental and medical insurance, stock retirement program and more. For consideration, send a resume with salary history in confidence or call collect:

Dee Burman  
Corporate Placement  
(312) 937-7000

**ABBOTT**  
NORTH CHICAGO, ILL. 60064

Abbott is an Affirmative Action Employer

## PEOPLE AND COMPUTERS:

They are not the same! If you want freedom to think, to learn, to grow and to advance rapidly... If you want less unnecessary stress, less pollution, less traffic, less crime, fewer senseless rules, and lower living expenses... If you want more responsibility, more education, more say in your career and life, and more valid opportunity... talk to Mc² and resign from the rat race. Located near a major research and development center at the edge of the Adirondacks, Mc² is a young, rapidly expanding company of computer professionals operating in the vanguard of technology. If you are a talented, energetic intelligence or cartographic systems analyst, DBMS engineer, or system performance modeller and want to use sophisticated tools and technology to expand the frontiers, rush your resume to:



**MEASUREMENT CONCEPT CORPORATION**

1721 Black River Blvd.  
Rome, NY 13440



position announcements

position announcements

position announcements

position announcements

position announcements

## PROGRAMMER/ANALYSTS

Think Career...  
Think Informatics!

INFORMATICS, INC., one of the nation's largest independent suppliers of consulting and programming services, is continuing to expand in TEXAS. We are seeking career oriented individuals who want to be a part of our professional staff and have one (1) or more years' experience in at least one of the following disciplines:

|                 |                 |                 |
|-----------------|-----------------|-----------------|
| <b>LANGUAGE</b> | <b>SOFTWARE</b> | <b>HARDWARE</b> |
| COROL           | IMS             | IBM 370, 303X   |
| ALC             | CICS            | MINIS           |
| PL/I            | MARK IV         |                 |

### DATA BASE MANAGEMENT DISTRIBUTED DATA PROCESSING

Our opportunities for client exposure, diversified career development, and long term professional growth are unequalled. We offer excellent salaries, paid overtime, relocation reimbursement, revenue-sharing bonuses, and a comprehensive benefits package, including dental insurance. Send resume in confidence to the location of your choice.

#### INFORMATICS, INC.

10300 N. Central Expressway  
Building II, Suite 167  
Dallas, Texas 75231  
(214) 696-1900

2900 N. Loop West  
Suite 1300  
Houston, Texas 77092  
(713) 680-2100



**informatics inc**  
Professional Services Operations West

Equal Opportunity Employer M/F

## RECESSION?

You may not be out on the streets if there's a recession, but if you're tired of the general uneasiness and the pause in career growth when employers are "cutting back," then consider the alternative. No one has to tell you that employers are moving to the South-eastern United States, where the economy is growing, unemployment is low, and housing is affordable. THERE'S NO RECESSION IN OUR DP MARKET.

|                        |       |
|------------------------|-------|
| Systems Analysts       | \$30K |
| Sr. Programmer/Analyst | \$38K |
| Systems Programmer     | \$33K |
| Programmers            | \$20K |

Clients pay all costs. Mail confidential resume to: Dave Gahan.

### SYSTEMSEARCH, INC.

P.O. Box 6525 C.W. 3  
Greenville, SC 29606  
(803) 288-9870

## Charge us!

[You can charge your subscription to Computerworld on American Express, Visa or Mastercharge]



**COMPUTERWORLD**

## PROGRAMMER/ANALYSTS

Are you in control of your career?  
Is your growth consistent and predictable?  
Have you taken time to analyze your career path?

Dunhill of Fort Worth has been helping Professional Programmer/Analysts answer these questions and make career decisions for over six years. Many of those we have assisted are now Managers and as such, hire their employees through us. So you see, we have a very definite interest in your career.

### OUR FUTURE DEPENDS ON YOU AND WE KNOW IT!

To get started on your career plan call or write

#### DUNHILL OF FORT WORTH

Personnel Consultants  
901 Ridgely Bank Bldg  
Fort Worth TX 76118  
(817) 732-8191

P.S. Ask us how to write a Resume that gets RESULTS. By the way, Dunhill of Fort Worth works nationwide and our fees are paid by the company.

## EDP SPECIALISTS

**SOFTWARE ENGINEERS/EDP MGT/SYSTEMS ANALYSTS/PROGRAMMERS**, \$17,500-\$57,200. Mpls, Midwest & National listings. Send resume to EDP Specialist, J. R. Shoemaker, ABC EMPLOYMENT SERVICE, 401 2nd Ave. S., Minneapolis, MN 55401 (612/339-1453) (Collect) (Highest Quality of Life Anywhere).

**EDP CAREER OPPORTUNITIES** - Sunbelt, national and international. \$18,000-\$50,000. Positions available in all areas of data processing. Let a professional represent you. Call or send resume w/salary history in confidence to W. L. Williams, LLOYD RICHARDS PERSONNEL, 507 S. Main, Suite 502-C, OK 74103 (918/582-5251). "Professional personnel service for over 20 years."

**PROGRAMMERS/SYSTEMS ANALYSTS**, \$18,000-\$45,000. Have a great fall in New England! Send resume or call Dick collect at oldest employment service in Central NE (estab. 1946). LANE EMPLOYMENT, 405 Main St., Worcester, MA 01608 (617/757-5678).

**EDP MANAGEMENT/SYSTEMS ANALYSTS/PROGRAMMERS**, \$18,000-\$40,000+. Choice upstate NY & U.S. openings. Entry level thru top corporate positions. EDP placement specialists. In confidence send resume or call James F. Corby, Pres., NORMILE PERSONNEL, 5 Leroy St., Box 110 Westview Station, Southampton, NY 13905 (607/723-5377).

**SOFTWARE ANALYSTS/SOFTWARE DEVELOPMENT**, \$20K-\$33K. Major clients seeking experienced software people for design & tech support positions. Midwest locations. Send resume in confidence to Scott Sangstad, O'CONNELL-SCHMIDT-ROHN, INC., 757 N. Broadway, Milwaukee, WI 53202 (414/224-9500).

**npc** NATIONAL PERSONNEL CONSULTANTS

## PROCESS COMPUTER SYSTEMS ENGINEERS

# Join Aramco Services Company in Houston for top salaries, unique experience

When Aramco Services Company, a wholly owned subsidiary of Aramco, the largest oil-producing firm in the world, hires you as a process computer specialist, you'll get a top salary. Plus a great benefits package. You'll also be starting out on what could be a very rewarding Aramco career position.

### Work in Houston on the world's biggest overseas projects

Aramco is the key firm involved in the development of the energy resources of Saudi Arabia.

Many Aramco projects are very large in scope, complexity, and in the application of advanced technology. There are challenging smaller projects, as well.

Many of the projects are supported in Houston by process computer specialists who serve as the key liaison between Saudi Arabia and U.S. vendors or turnkey contractors. Often, the smooth start-up and trouble-free operation of a project costing millions, or even billions, are aided by an individual or a team in Houston.

Can you think of any other place in the country quite like this where you could start to carve out such an interesting career?

### This could be the job you've waited for

In this key job supporting major Aramco projects, we require *process computer software engineers* with BS degrees in engineering, math or computer sciences, and 3 or more years' experience in various real-time processes or SCADA projects.

We also need *process engineers* with BS degrees in chemical engineering, and 3 or more years' experience in designing and maintaining process computer and instrumentation systems.

*Process computer hardware systems engineers* are needed with BS degrees in electrical engineering, computer science or engineering technology, plus 3 or more years' experience in designing and maintaining process computer and instrumentation systems.

You'll be based in Houston, but from time to time you will be required to travel to vendors in the U.S. and to field sites in Saudi Arabia.

Interested? Send us your resume and we'll get back to you very soon. Write: Aramco Services Company, Section DOM, Department CW090880JLSB, 1100 Milam Building, Houston, Texas 77002.

## ARAMCO/HOUSTON

SERVICES COMPANY, DOMESTIC

In medical information systems ...

## TECHNICON

on the SAN FRANCISCO PENINSULA  
is way out front!

Ongoing R&D efforts maintain our leading position as pacesetters in the Health Care Industry as we come up with "Tomorrow's Technology Today!"

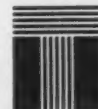
## HARDWARE ENGINEER

Utilize your technical background & skills at vendor interface!

You will be responsible for developing hardware specifications for equipment used in the medical information system. You will also evaluate and provide hardware design for external sources & provide technical assistance for new & existing customer contracts.

Besides heavy interface with outside vendors, this position requires experience in hardware circuitry design and system integration of computer equipment along with experience & familiarity with CRT terminals, printers and telecommunications equipment used with medium scale computer systems. Your ability to document procurement specifications and technical descriptions necessary.

Our benefits are most comprehensive, our salaries most attractive ... and, our highly professional, small company atmosphere is an added appeal. Put your career way out front ... Send your resume including salary history and requirements, or contact Rita Oida in our Personnel Department, Technicon, 3255-1 Scott Blvd., Santa Clara, CA 95051. 408/727-9400. An equal opportunity employer M/F. Individuals only apply.



**TECHNICON**

Technicon Medical Information Systems Corp.



position announcements

position announcements

position announcements

position announcements

position announcements

## LOOKING FOR A REAL CAREER CHALLENGE?

NORTHWEST PIPELINE CORPORATION, a leader in the interstate transmission of natural gas has a challenging position for you in beautiful Salt Lake City, Utah. We are currently looking for:

### SENIOR ANALYSTS

You must have a BS degree and five or more years programming and design experience using COBOL and IBM/JCL. Substantial experience in business systems analysis, plus project leadership responsibilities required. Experience in structural techniques, IMS, DB/DC programming and analysis desired. You will design and develop new data base systems. Duties will also include user requirement analysis, cost/benefit studies, system design, systems architecture, data base design, system test, and user trainer and installation.

Northwest Pipeline Corporation is well known for its excellent salaries and extensive benefits package. For immediate consideration, send your resume to: NORTHWEST PIPELINE CORPORATION, Attn: Fred Thomas, Employment, P.O. Box 1526, Salt Lake City, Utah 84110. Or call COLLECT (801) 534-3921. We are an Equal Opportunity Employer M/F.

**NORTHWEST  
PIPELINE  
CORPORATION**

## EDP Audit Career Opportunities You'll Never Outgrow

Join a professional team who review systems development and documentation of our financial, manufacturing and distribution systems for domestic and international operations. Will advise on improving operational control and effectiveness. Positions offer travel opportunity.

### Sr. EDP Auditor

Requires Bachelors degree in business or accounting plus 3 years experience as an analyst programmer plus 1 year experience in EDP audit. Any appropriate mix of experience acceptable. Prefer experience in financial, manufacturing or retail operations in an on-line data base environment.

### EDP Auditor

Requires business degree plus 2 years experience in financial auditing plus some experience in systems or applications programming in an on-line environment.

Both positions offer a broad spectrum of responsibility and opportunity to expand knowledge in management controls. In addition, we support individual development through in-house and outside training programs and offer an excellent compensation benefit package including profit sharing and stock purchase plans. For immediate consideration please send resume and salary history in strict confidence to: **Levi Strauss & Co., Professional Employment, Dept. KB-43, Two Embarcadero Center, San Francisco, California 94106.** We are proud to be an equal opportunity and affirmative action employer.



QUALITY NEVER GOES OUT OF STYLE



### CITY OF BROCKTON, MASSACHUSETTS

As a leader in Municipal and School Data Processing rapidly expanding their Data Processing organization to meet growing needs, we have current career openings which include:

**SYSTEMS ANALYST** \$17,450 - \$21,870 **SENIOR PROGRAMMER** \$17,450 - \$21,870 **COMPUTER OPERATOR** \$12,284 - \$15,618

Challenging opportunities are available now in our state-of-the-art facility working with a dynamic staff and our Univac 9040 Computer System with communications and on-line programming.

Consider our excellent working hours and environment, State Retirement, Blue Cross/Blue Shield-Master Medical and other fringe benefits coupled with FREE parking under 24 hour security and swift commuting adding leisure hours each work day.

Put your experience and talent to work for an organization that will appreciate your contributions.

For prompt consideration forward resume with salary history in confidence to:

**Arthur M. Brumfield**  
Supervisor of Data Processing  
City Hall  
Brockton, MA 01901  
An Affirmative Action  
Equal Opportunity Employer  
NO AGENCY CALLS ACCEPTED

## NATIONWIDE PERSONNEL SERVICE, INC. EDP Recruiters Since 1968 DATA PROCESSING CAREERS 1,000 + Current Positions

That's right! On a consistent basis there are more than 1,000 EDP positions listed through Nationwide and our Associates. BUT that's not the only reason Data Processing Professionals have relied on us for 12 years.

### The Other Reasons Are:

1. Fast & confidential placement on an individual basis by our team of 10 professional consultants.
2. Major National & International Clients.
3. Fees & expenses 100% Co. paid. No contract!
4. 220 affiliates in 140 North American cities that we can put to work for you if desired, collectively or individually.

Send Resume To  
P.O. Box 35925C3  
Fayetteville, N.C. 28303  
or Phone

**TOLL FREE  
FOR INFORMATION  
1-800-334-4220  
NC Collect to Pat Boas  
(919) 484-4101**

### PROGRAMMER/ANALYST

The Michigan Employment Security Commission has an immediate opening for a full time programmer to work on the implementation and maintenance of a statewide data retrieval system. Responsibilities will include designing, developing and documenting systems and application level programs; working with others to analyze problems, find solutions, maintain and update software. Qualifications include experience in programming for social science research applications and FORTRAN or PL-1. Qualified applicants should also have skill in writing technical documentation as well as have rudimentary knowledge of economic and statistical techniques. Salary range \$50,000-\$60,000 depending upon experience. Excellent benefits. Inquire Michigan Employment Security Commission, Research & Statistics Division, 7310 Woodward Ave., Detroit, MI 48202, (313) 878-6439. Equal Opportunity Employer.

### ASSISTANT DIRECTOR ACADEMIC COMPUTING

Oregon State University invites applications for the above position, carrying rank of Research Associate or Research Assistant (unclassified). Duties include management of a staff of consultants, specialists and programmers, as well as development of plans for academic computing services. Minimum requirements are an Advanced Degree in Computer Science or a related field (PhD preferred) and at least 6 years experience in a research or academic environment. Significant management or supervisory experience required and applications software development experience. Job stability preferred. Salary range is \$30,000-\$44,000. Applicants should send a complete resume and 3 letters of reference by Sept. 25, 1980 to: Mr. Thomas L. Yates, Director, Computer Center, Oregon State University, Corvallis, OR 97331.

Oregon State University is an equal opportunity, affirmative action employer and complies with section 504 of the Rehabilitation Act of 1973.

### Look South

We represent hundreds of exciting opportunities throughout the south... all fees paid!

- COBOL, ALC, Fortran P/V-1 Programmers
- IBM OS/VS, VS, MVS, Systems Programmers
- IMS, IDMS, & other DB/DC exp.
- Burroughs, Honeywell, minicomputers

Let us help you find the RIGHT position. Send your resume to:

### SEARCH E.D.P., INC.



13773 N. Central Expwy.  
Suite 130  
Dallas, Texas 75243  
(214) 783-1018

### SCIENTIFIC PROGRAMMER

Push the state-of-the-art in spacecraft technology and advance your technical skills. We need, in the D.C. area, senior and middle level programmers with 2 years minimum recent DEC equipment experience to include real-time environment using FORTRAN and Assembly languages. Minnemonics, Inc. offers competitive salary, all fringes including company paid insurance, retirement and profit sharing. For immediate consideration send your resume to, or call, Harry Thompson, Minnemonics, Inc., P.O. Box 1114, Hallandale, FL 33001. 305/725-1117.

## PROGRAMMER/ANALYST THERE'S A BRIGHT NEW TOMORROW. IT'S DOCUMENTATION IN FLORIDA.

It's an innovative approach to the design, manufacture and marketing of data processing products, systems, and subsystems. It's based on state-of-the-art technologies the giants of the industry have often failed to exploit.

It's a future full of promise.

We offer competitive salaries, comprehensive benefits, congenial co-workers, and many more opportunities for after-hours excitement.

For a bright new tomorrow send your resume and salary history to **Ed Johnson, Documentation Incorporated, P.O. Box 1240, Dept. 571, Melbourne, Florida 32901.**

An Affirmative Action/  
Equal Opportunity Employer.

**DOCUMENTATION  
INCORPORATED**  
An Equal Opportunity Employer M/F/V/H

## SALES PROFESSIONALS

Capitalize on the  
advantages of joining  
a newly formed company  
with limited competition  
and unlimited markets!!

Selling in an environment that is innovative, challenging, and encouraging.

This is a ground floor opportunity to join the sales staff of a new affiliate to an established, well known publisher entering the information services market. Selling is accomplished via the telephone to a nationwide market.

Growth within the organization is assured, with additional products, services, and markets coming on stream immediately. Your ambition and sales creativity will be rewarded by an almost unlimited career path.

We are located in the Philadelphia area in the heart of one of the country's fastest growing commercial centers. We offer a superior compensation and benefits program including complete relocation package.

For prompt consideration please send resume in confidence to:

**DATA DECISIONS, INC.**  
A participating subsidiary of the  
Ziff-Davis Publishing Company.  
Attn: Director of Personnel  
20 Brace Rd.  
Cherry Hill, N.J. 08034  
Equal Opportunity Employer, m/f.

## HONEYWELL DATA BASE PROFESSIONALS

CACI, a major systems development and consulting firm, is currently interviewing for positions in a rapidly growing data base development group located at our Harrisburg, PA office. Individuals selected will be key members of an advanced system development team involved with long range DBMS applications in the Inventory Management/Logistics disciplines. Positions currently available include:

- **Data Base Systems Analyst**  
Five or more years experience in the analysis, design and evaluation of large DB systems. Excellent analytic, communication and customer interface skills.
- **Data Base Programmer/Analyst**  
Three to five years experience in the analysis, design, programming of on-line DB applications in such areas as bill of material processing, inventory control and configuration management utilizing COBOL, 74 and IDS-2.
- **Data Base Programmer**  
Two to three years COBOL business applications programming experience utilizing on-line system development methods with specific expertise in CODASYL DBMS prefer IDS-2 (DM-4).
- **Environment:**  
Honeywell Level 68/40; GCOS, TSS, IDS-2 (DM-4), COBOL 74

Positions offer exceptional professional growth, advancement and compensation to the technically superior individual desiring challenge, recognition and opportunity. Respond in confidence to: **CACI - Inc., Federal, Mr. John Rowatt, 9604 Lenker Street, Mechanicsburg, PA 17055**

An Equal Opportunity Employer M/F/H/V

position announcements

position announcements

position announcements

position announcements

position announcements

## Data Processing Professionals

You'll develop business systems in support of our manufacturing operations, including financial, production control and purchasing functions.

You'll work in facilities that are perhaps the finest of their kind in the world, including an ultra-modern complex nearing completion in a Southern California beach suburb. And the equipment you'll use is among the best available — Burroughs 6800 hardware, DMSII DBMS, and on-line systems. And soon we'll be adding a second CPU. Let us know which of these opportunities you're best qualified for.

### Systems Analysts - Manufacturing

You'll design, develop, and implement on-line real-time systems. You'll need at least a BS degree and experience in a fast-paced organization where the emphasis is on professional systems and controls related to manufacturing. Certification by the American Production and Inventory Control Society is a plus.

### Systems Analysts - Financial

You should have knowledge of financial analysis and computerized information systems. An MBA in Finance, with some experience in computer programming (COBOL), on-line real-time applications, and financial reporting systems is preferable.

### Lead Programmer/Analysts

You'll be responsible for technical direction of programmer/analysts making substantial enhancements to the Burroughs PCS III software system. You must have manufacturing production control experience.

### Programmer/Analysts

You'll design and develop manufacturing software systems and system enhancements. You should have a strong background in COBOL applications on Burroughs B6000/7000 series computers. Experience with DMS II and Reporter a plus.

You'll receive a highly competitive salary and outstanding benefits, including fully-paid family medical, dental, and vision care insurance, fully-reimbursed education, and company-participating savings and retirement plans. It's all at Hughes, where we have a backlog of 1,500 projects worth \$4.5 billion.

Please send your resume to: Dan O'Daly, Hughes Aircraft Company, Electro-Optical & Data Systems Manufacturing, Dept. EM-42-WC, 9841 Airport Blvd., Suite 516, Los Angeles, CA 90045.

## HUGHES

HUGHES AIRCRAFT COMPANY  
ELECTRO-OPTICAL &  
DATA SYSTEMS  
MANUFACTURING

Proof of U.S. Citizenship Required  
Equal Opportunity Employer

### PROGRAMMERS/ANALYSTS

New Facilities Opening/New Contracts Won  
\$23,000 - \$36,000

Due to Sun Belt expansion and newly awarded contracts in the Northeast and Northwest. Scientific and Business Applications positions are opening up across the nation. Tech-Ed Services is an employment marketing service that recruits and screens candidates for a variety of client companies.

Selected candidates will possess an understanding of analysis or design in PL/I, FORTRAN, COBOL, ALC, ASSEMBLY or High Level Languages. Positions are available in modeling, compiling, statistics, and communications. Knowledge of CICS, TOTAL, SYSTEM 2000, or similar DBMS preferred. Hardware experience required with IBM 360/370, 3033; UNIVAC 1108/1110; H6000; DEC 10/20, PDP 11; HP3000; CDC 6600; or similar systems. Particular needs are in Boston, Dallas, Washington, Los Angeles, and Seattle/Portland.

If you wish to explore these opportunities confidentially, please send your resume, salary history, and geographic preference to:

**TECH-ED SERVICES**

5020 Sunnyside Ave., Beltsville, MD 20705  
(800) 638-0254

## "EDP Pros"

At PS&R we don't broadcast your resume, nor do we offer any gimmicks — simply personalized career consulting and discreet marketing of your talents.

Call 703-379-4501 for more information or send resume to  
5600 Columbia Pike, Falls Church, Virginia 22041.

**PS&R**

Personnel Systems  
& Resources

### APPLICATIONS AND SYSTEMS / SOFTWARE

# PROGRAMMERS

ALSO: IMS AND DATA BASE SPECIALISTS; SYSTEMS ANALYSTS; CICS SPECIALISTS

## ★ CALL COLLECT ★

DAYS & EVENINGS SEVEN DAYS A WEEK — ALL YEAR LONG

NO RESUME NEEDED —  
TELEPHONE INTERVIEW



**609-881-2698**  
NOON TO 11 PM

NATIONWIDE (LOCAL OR RELOCATION) CONFIDENTIAL NO-FEE

We offer the only real alternative among fee-paid agencies. HERE'S WHY: 1. Because we are not a franchise or a branch, we provide TOTAL NATIONWIDE SERVICE to relocate professionals, or those seeking new employment where they now live. Regardless of where you live, we can locate new job opportunities virtually anywhere in the United States. Our horizons are unlimited! 2. We PROTECT YOUR CURRENT JOB by marketing only your professional skills. 3. We have thousands of open job orders, but we go further. ACTIVELY MARKETING YOUR SKILLS. 4. Because we conduct a thorough, no-charge technical interview over the phone, at no cost to you, YOU DON'T NEED A RESUME to explore new job opportunities. Whatever your experience - and wherever you live - WE CAN HELP!

CALL US NOW - AT NO COST - TO DISCUSS YOUR REQUIREMENTS

**PROGRESSIVE MANAGEMENT**

140 East Clinton Street, Clayton, NJ 08312  
Telephone Interviews Only

### GET AN EDP JOB ANYWHERE

CALL FREE  
1-812-338-6714  
CALL COLLECT



Analysts, project leaders, programmers with more than a year's experience let us help you find a better job. For a decade we have been placing EDP professionals like you all over the country through our network of 22 national offices. Send your resume or call

**Electronic Systems  
Personnel**  
858 TCF Tower 121 So. 8th Street  
Minneapolis, MN

client companies assume  
our fee.



EDP Placement Specialists  
A Member of National  
Computer Associates

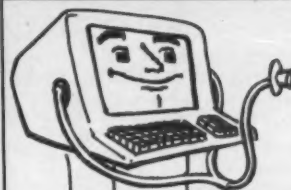
## Software Quality Analyst

Rapidata is a dynamic leader in computer based information services.

We are looking for an individual to become involved in every phase and activity in the development of Rapidata's software products. The successful candidate will be responsible for product quality analysis, software testing, specification and documentation reviews, and developing test procedures for new products and enhancements.

If you have 3-5 years system software development experience, an in-depth knowledge of software testing and review techniques, a Bachelor's degree in Computer Science or an analytical discipline, and good communication skills, and seek an excellent compensation and benefits package including 100% tuition refund program, employee stock purchase plan, Call (201) 227-0035 or forward your resume including salary history and requirements to: Howard Turbowitz, Coordinator, Professional Recruiting, Rapidata, 35 New Dutch Lane, Suite 100, Fairfield, New Jersey 07004. Equal opportunity employer M/F.

**rapidata**



## Data Processing Professionals

Be the pulse of the  
expanding Health Care  
Industry... in Southern California

A State-of-the-Art environment will be yours when you join Pacific Health Resources, an innovative Consulting Firm responding to the operational and administrative needs of Hospitals and Medical Service organizations.

Currently, we utilize an IBM 370/148 using OS/VS1, CICS and IMS under DL1 to provide services to a network of Hospitals throughout California. In addition, an IBM 4341 processor is on order to offer on-line State-of-the-Art application support to our expanding roster of clients. Growth opportunities exist now for:

- SENIOR DATA BASE ANALYST
- SENIOR SYSTEMS PROGRAMMER
- SYSTEM PROGRAMMER
- APPLICATIONS PROGRAMMER

Our benefits are complete, our salaries extremely attractive. For immediate consideration, CALL COLLECT or submit your resume, in complete confidence, to Skip Carr, (213) 742-6413, or write 1433 S. Grand Avenue, Los Angeles, CA. 90015. An equal opportunity employer. No agencies, please.



## Pacific Health Resources

"Management Resources for the Health Care Industry"

### ROBERT HALF

#### FUNDELT OPPORTUNITIES

- P/A-Bal-Assembler \$23K
- Prog-Test 3-COBOL \$20K
- P/A-Basic/Fortran \$28K
- P/A-Fortran-BS-Chem/Eng \$30K
- Prog-COBOL-Sorting \$18K
- P/A-COBOL-NCR \$18K
- P/A-COBOL-OS/VS1 \$22K
- P/A-COBOL-OS/VS2 \$23K
- P/A-COBOL-Fortran \$31K
- Prog-RPG SYS 3/34 \$21K

ROBERT HALF  
OF LOUISIANA, INC.  
135 St. Charles Ave. #1200  
New Orleans, LA 70130  
(504) 524-3773

#### SYSTEM ANALYST

We are looking for a self-motivated data processing professional to analyze and implement a production scheduling and control system using the latest concepts in distributed processing.

Qualified applicants must have an M.S. in Computer Science or an M.D.S., and a B.S. Degree in Business Administration or Economics.

Applicant must also have knowledge in the following areas:

- IBM S/3 Model 180 CCP
- IBM S/34
- Communication System
- RPG II and Fortran
- Quantitative analysis
- Distributed processing

48 hour week. Salary \$20,000/year. Send resume to: RHC Operating Corp., Borgeson-Peterson Peopleport Corp., 74 Commerce Way, Woburn, MA 01801.



position announcements

position announcements

position announcements

position announcements

position announcements



## •PROGRAMMERS •PROGRAMMER/ ANALYSTS

Challenging and rewarding opportunities to work with growing state-of-the-art communications systems.

Take advantage of our software design and development opportunities for professionals.

### EXPERIENCED ON TANDEM COMPUTER SYSTEMS

With TAL expertise. Should have participated in development of on-line message switching systems with a data base interface.

Applicants will be involved in ground floor applications design/development/implementation.

### EXPERIENCED ON UNIVAC 1100 SERIES COMPUTER SYSTEMS

Under EXIC 8, with Assembly language expertise. DMS 1100 knowledge will be a plus.

Excellent benefits include life and health insurance, plus continuing education assistance. Salaries are commensurate with experience and education. Submit resume, including salary history in strict confidence, to: Mr. Robert L. Freilich, Director of Professional Employment, Dept. CW 98.

## Western Union Telegraph Company

One Lake Street  
Upper Saddle River, New Jersey 07458  
An Equal Opportunity Employer M/F/H

## Software Programmer

### Live & Work in Beautiful Boise, Idaho

ALBERTSONS, one of the country's most dynamic super-market operations has an opening for a Software Programmer with the ability to provide technical support to the programming and operations staff. A min. of 2 yrs. experience in BAL and COBOL programming necessary. Teleprocessing, CICS and VSAM experience helpful. Current system is IBM 370-3031 operating under OS-VS1.

ALBERTSONS offers an excellent benefits package including Company paid medical/dental/vision coverage for you & your dependents. Please submit resume including salary history to Employment Manager, ALBERTSONS, P.O. Box 26, Boise, ID. 83726. An equal opportunity employer.



### SYSTEMS/PROGRAMMING MANAGER AND SENIOR PROGRAMMERS

To join a 1 1/2 billion dollar bank's computer programming section, you will be responsible for a wide variety of on-line savings, checking and loan applications. The bank's newly installed NCR V8575 Criterion, is one of the most up-to-date computers on the market today, and the largest NCR main frame in the Albany, Schenectady, Troy Capital District Metroplex. These positions are a unique opportunity for individuals seeking advancement in the exciting, evolving bank data processing field and offers an excellent opportunity for interested individuals to extend their skills and to work in a team environment. Applicants must have a minimum of 3 years successful program experience on NCR hardware, preferably on a medium to large scale computer system. Attractive salaries offered for these positions — commensurate with experience. The bank's total benefit package is outstanding. Please phone Albany Savings Bank, Albany, New York, 518-445-3043, for an appointment.

## DIRECTOR OF ADMINISTRATIVE SYSTEMS AND PROGRAMMING EASTERN KENTUCKY UNIVERSITY

Director of new division within the University reporting directly to the Vice President for Public Service and Special Programs.

**RESPONSIBILITIES:** Manage the planning, design, acquisition, implementation and maintenance of all administrative applications systems; establish procedures for formal project control reporting; resource monitoring and utilization forecasting; participate in evaluation of bids for new computing hardware; recruit, train, evaluate, and direct the technical effort of divisional members; participate in long range information systems development and revision; report timely and accurate information to appropriate administrative staff and committees.

Applicants should have minimum 5 years managerial experience in computing including on-line information systems. Priority consideration will be given applicants with specialized prior experience in higher education.

Forward resume and references to Vice President William E. Sexton, Eastern Kentucky University, Richmond, KY 40475 by Sept. 18, 1980.

An Equal Opportunity/Affirmative Action Employer.

## WE WANT YOU

If you are consulting-oriented and have talent—then we have a future for you.

**CURRENT OPENINGS**

|   |   |   |
|---|---|---|
| <b>In New Jersey</b><br>• UNIX/C, micro<br>• a plus | <b>In Connecticut</b><br>• IDMS data base<br>design • COBOL<br>applications | <b>In New York City</b><br>• CICS Internals,<br>applications •<br>COBOL, assembler. |
|---|---|---|

Minimum 2 years experience required. Degree is a plus.

If you qualify, send a resume in confidence to:

Gene Primelt  
Worldwide Computer Services  
16 East 42nd St., 16th Floor, New York, New York 10017

An equal opportunity employer.

## IBM SYSTEM/34 — WORD PROCESSING "Z-WORD/34" — FROM "DOWN UNDER" NOW SEEKING SALES AGENTS

Highly successful "Z-WORD/34" package available from Australian developers — Wilkinson Computer Services Pty Ltd. Acclaimed as best Z/34 WP software in the world. Used in many countries. Agents now sought for each State Region in USA. Prefer IBM System/34 software firm. If interested please contact developer below who will shortly visit USA to appoint agents. Features include:

- Full-screen text editor enables powerful text manipulations
- Unique method integrates existing DP files with word processing
- Generates programs to allow screen entry-update of DP files. Simple, reduces dependence on programmers
- Letter quality printer available soon
- 30 many uses — manuals, procedures, price and product lists, personalized and repeat correspondence, proposals, quotations, etc.

With Z-WORD, you have the LAST WORD on your System/34!

Contact: **MURRAY WILKINSON**  
 Wilkinson Computer Services Pty Ltd  
 Suite 2, 540 Bakers Road, Hawthorn, Victoria, Australia. Phone 01-518-1301

## HOUSTON EDP PROFESSIONALS

**SYSTEM ANALYST — \$25-30,000**  
**PROGRAMMER-PROGRAMMER/ANALYST**  
**\$18-23,000**

**SYSTEMS PROGRAMMERS \$30-33,000**

Experience — Insurance  
 Benefits — Dental, parking, profit sharing,  
 plus others.

Hardware — IBM 370/MVS/COBOL

**PROGRAMMERS — \$16-20,000**  
**PROGRAMMER/ANALYSTS — \$18-24,000**  
**ANALYST — \$20-26,000**

Experience — Banking Systems  
 Applications — DDA, Savings, Trust, MSA,  
 G/L, Payroll, I/L, C/L, Credit  
 Cards

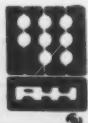
Hardware — IBM 370/MVS/COBOL

**ANALYSTS/PROGRAMMERS \$20-27,500**

Experience — Manufacturing  
 Applications — Inventory Control, Order Entry,  
 MRP, Billing, etc.  
 Benefits — Dental, company-paid life/  
 health, profit sharing, savings  
 plan, etc.

Hardware — IBM 370/MVS/IMS/COBOL

Call JIM FLEMING collect at 713/688-1800 for  
 further information or send a copy of your  
 current resume to:



**ROBERT HALF  
OF HOUSTON, INC.**

720 N. Post Oak Rd. — Suite 228  
 Houston, TX 77024

### PLANNING ANALYST

Responsible for establishing short and long range Data Processing plan. Work with consultants and users in continuing long range planning for the ongoing development of our internal computer resources. Requires a B.S. in Computer Science or Business Administration with experience in planning and specialization in project control/management, software conversion projects, internal market/workload analysis, financial analysis forecasting, and/or long range Data Processing planning. Excellent salary and fringe benefits. Send resume in confidence to:

**Personnel Division  
 BASIN ELECTRIC  
 POWER COOPERATIVE  
 1717 East Interstate Avenue  
 Bismarck, North Dakota 58501**  
 AN EQUAL EMPLOYMENT  
 OPPORTUNITY EMPLOYER

### Computer Science:

Applications are invited for a full-time, tenure-track faculty position, available 1 February 1980, to teach Computer Science at MacMurray College, a small private 4-year liberal arts institution in Jacksonville, Illinois. Principal responsibilities of the position are teaching at all undergraduate levels and assisting with the ongoing curriculum development of a major in computer science. Computer facilities include a PDP-11 operating under RSTS/E timesharing; 4 micro-processor units; mag tape, disk and diskette storage; and graphics terminals. Applicants need to hold at least a master's degree in computer science or a Ph.D. in a related field with some formal background in computer science. Send resume and three references to Eugene Kohlbrecker, Director, Computer Faculty, MacMurray College, Jacksonville, Illinois 62206. Interested persons should apply by 30 October 1980.



**COMPUTERWORLD**

### CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are \$73.50 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs \$147.00 per insertion. Extra space is available in half-inch increments and costs \$36.75. Box numbers are \$10.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us), WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: \_\_\_\_\_ columns wide by \_\_\_\_\_ inches deep.

Issue Date(s): \_\_\_\_\_

Section: \_\_\_\_\_

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Company: \_\_\_\_\_ Title: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Send this form to:  
**CLASSIFIED ADVERTISING, COMPUTERWORLD**  
 375 Cochituate Road, Route 30, Framingham, MA 01701



buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

BUY SELL SWAP

### IBM 158 APU Available October IBM 3880's Available November

Contact: Jerry A. Borley  
(303) 888-0820

JBI ASSOCIATES, INC.  
12873 West 3rd Place  
Lakewood, CO 80228



Member of  
Computer Dealers Association

### IBM S/32

Model B-34

14K

13.6 mgb disk  
155 LPM

Has been under  
IBM maintenance  
since purchased in 7/75.

Custom Rubber Products, Inc.  
P.O. Box 11100  
Houston, TX 77018  
713/691-2211

URGENTLY NEEDED!  
CASH AVAILABLE.

# DEC 11/34

SYSTEM

CALL (617) 261-2750

### FOR SALE BASIC FOUR

#### MODEL DESCRIPTION

200-A 48K System (16K User)  
Video Display Terminal  
3229 120 CPS Printer  
1341 10.0 M Byte Disk  
6401 Tape Drive 2.3 MB  
Upgrade to 9.2 MB

Accounting Software  
Call:  
800-441-9485  
Charles E. Deal

### IBM 3/8 FOR SALE

16K Core  
200 LPM Printer  
3741 Direct Attached  
Payroll-Order Writing-  
Sales Analysis Program  
IBM Maintenance  
3 YEARS OLD -  
NOW AVAILABLE  
MAKE OFFER

Call Gilbert McQuinn  
312/343-7840 (Chicago)

### SALE OR LEASE

4341-K  
3880-1

AS MANY AS YOU NEED!  
WHEN YOU NEED THEM.

COMPUTER  
SALES, INC.

P.O. Box 56  
Metawan, New Jersey 07747  
(201) 583-6816

### BY OWNER Best Offer

3-DEC 11v03 Systems  
Complete

- LSI 11, VT52, Dual floppies
- 2-16kw, 1-12kw
- Cabinet, power, interfaces
- Centronics printer interfaces
- RT 11 V3 operating systems
- DEC business basic

2-Centronics 703 printers  
Haggard & Kristen  
512-992-2596  
PO Box 8752,  
Corpus Christi, Tx 78412

### FOR SALE SYSTEM 3/10

5410 Processor 16K  
5203 Printer 300 LPM  
5444 Disk Drives  
(2 fixed, 2 removable)  
5496 Mod 1 Data Recorder (1)  
5496 Mod 2 Data  
Recorders (2)  
5424 MFCU

#### MTST

I.B.M. "Selectric" Typewriter  
Magnetic Tape IV (2)

CONTACT  
Wally Karpinski  
312/966-2150

### FOR SALE

SPERRY UNIVAC 90/30  
COMPUTER SYSTEM

65K Memory. 3-29 MB Removable Disk can be upgraded to 58. 300 CPM Reader. 400 LPM Printer. Available after October 1, 1980. Call Mrs. Grandon 800-327-7673. In Florida (x Miami) 800-432-9385.

### For Sale or Lease 24 months or longer

370/138 CPU

ICA, 3203-4 IPA,  
IFA, Console, 3046

Available December, 1980

Contact: Bob Fabbro  
MAURICES  
INCORPORATED  
216/727-8431

### FOR SALE OR LEASE

4341/L Processor  
370/138 J Processor  
3420/5 Tape Drive  
3333 DASD  
3830/2 Control

Forsythe/McArthur Associates, Inc.  
919 North Michigan Avenue  
Chicago, Illinois 60611  
(312) 943-3770

### WANT TO BUY USED ACCESS FLOORING

Top Prices Paid

Raised Computer Floors, Inc.  
Westwood, N.J. 07675  
201/666-8200

### FOR SALE BASIC FOUR

#### MODEL DESCRIPTION

200-A 48K System (16K User)  
Video Display Terminal  
3229 120 CPS Printer  
1341 10.0 M Byte Disk  
6401 Tape Drive 2.3 MB  
Upgrade to 9.2 MB

Accounting Software  
Call:  
800-441-9485  
Charles E. Deal

### FOR SALE Burroughs B1714 System

1 B1714 Processor with  
48 K Memory  
2 A9481 Dual Density Disk Cabinets  
1 A9247-2 Printer  
1 PC920 Key Punch  
45 B9985 Disk Cartridges

All equipment has been covered under Burroughs maintenance contract. Prefer to sell complete system, but will consider offers on single items.

Contact: Tom Pearson  
Oxley Equipment International  
P.O. Box 110236  
Nashville, Tenn. 37211  
(615) 259-3408

### FOR SALE

40 Computer Tape  
Library Storage Units.

Capacity - 360 tapes per unit

Also, 22,000 Easy Load 1 self-loading cartridges. All items are in excellent condition.

Contact:  
Donna Millburn  
Guif Research &  
Development Co.  
P.O. Drawer 2038  
Pittsburgh, PA 15230

# IBM

sys 32 sys 34

AND 5110

CALL (617) 720-0370

NATIONAL  
DATA  
SYSTEMS

### AVAILABLE IMMEDIATELY DEC PDP 11/34A

6 MONTHS OLD  
256 KB ECC MOS  
DUAL RL01 DISKS  
DZ11E PORT MPX  
LA36CE RSTS/E LICENSE

\$32,500 or OFFER.

Educational Systems  
Products, Inc.  
(918) 437-4820

### Honeywell 61/58

10 Meg Disk Storage  
300 LPM Printer  
30 Disk Packs  
1 DD8010 Keypunch

Software is Available

Call 216-271-2300  
Dan Martin

### YEAR-END SALE VAX PERIPHERALS 11/23 SYSTEMS

VAX  
• Memory (16K Chip)  
• REM03's  
• TEU77's  
• LP11YK  
• TEE-16

11/23 SYSTEMS/RL01, RL02  
Call T.P. Watson  
(303) 445-7213

### FOR SALE

# IBM

2914-1 4x4

Available Now

Jack McAuliffe  
4255 LBJ #210  
Dallas, TX 75234  
(214) 661-3981

# dataserv

Your Authority in the IBM Second Market

Call Dataserv when you need to know Second Market equipment values, market conditions or answers to other questions. People who know Dataserv trust Dataserv. We help you get maximum satisfaction with Second Market transactions. If the equipment you want to buy, sell or lease isn't listed, call our toll free number.

### GSD SYSTEMS

| SYS 3                     | SYS 32                      | SYS 34                    | SYS 38                    |
|---------------------------|-----------------------------|---------------------------|---------------------------|
| Short Term<br>Lease Avail | Sale or Lease<br>All models | All models<br>New or Used | Over 50<br>Del Pos. Avail |

### DPD SYSTEMS

|     |     |      |      |
|-----|-----|------|------|
| 125 | 138 | 4331 | 3031 |
| 135 | 148 |      | 3032 |
| 145 | 158 | 4341 | 3032 |
| 155 | 168 |      | 3033 |

Memory available for all IBM Processors

### PERIPHERALS

|      |      |      |      |
|------|------|------|------|
| 3330 | 3410 | 3203 | 1403 |
| 3340 | 3411 | 3505 | 1442 |
| 3350 | 3420 | 3525 | 2501 |

All peripherals available on short or long term lease

1255 1419 3880

All models  
Sale or Lease

On Line or Off Line  
Lease Sale

Lease now  
Flexible Terms

# dataserv

CALL TOLL-FREE 1-800/328-2406

Your Authority in the IBM Second Market IN MINNESOTA CALL COLLECT 612/544-0335  
DATASERV BUILDING, 9901 WAYZATA BOULEVARD, P.O. BOX 9488, MINNEAPOLIS, MN 55440

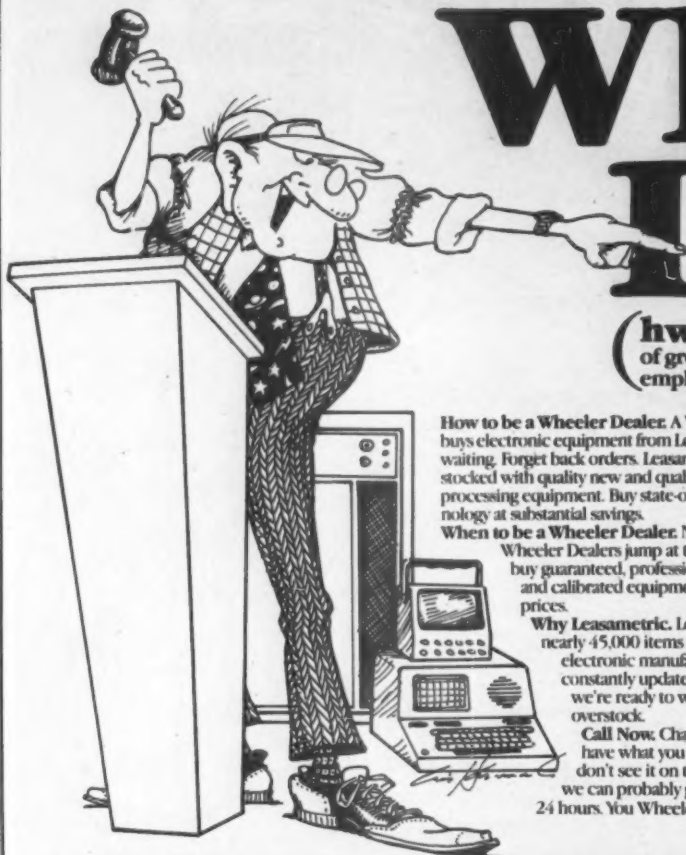
buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap



# Wheeler Dealer

(hwēl'r dēl'r, org. ME. n. pl., -ers. ger., -ing. 1) person of great influence who takes advantage of bargains. 2) casino employee. 3) clairvoyant purchaser of useful items.

**How to be a Wheeler Dealer.** A Wheeler Dealer buys electronic equipment from Leasametric. Forget waiting. Forget back orders. Leasametric is overstocked with quality new and quality used data processing equipment. Buy state-of-the-art technology at substantial savings.

**When to be a Wheeler Dealer.** Now! Sharp Wheeler Dealers jump at the chance to buy guaranteed, professionally maintained and calibrated equipment at discount prices.

**Why Leasametric.** Leasametric has nearly 45,000 items from 500 top electronic manufacturers. With constantly updated inventory, we're ready to wheel and deal on overstock.

**Call Now.** Chances are we'll have what you need, even if you don't see it on this page. And we can probably get it to you in 24 hours. You Wheeler Dealer you!

## Partial Equipment List:

|          |        |       |          |
|----------|--------|-------|----------|
| Courier  | 2770A  | I/S   | 210-A    |
| Courier  | 2770B  | TET   | 815      |
| Comprint | 912A   | TET   | 816      |
| DEC      | 15-120 | TL    | 735      |
| Diademo  | 1620   | TL    | 763      |
| HP       | 132900 | TL    | 765      |
| HP       | 2621A  | Telex | TC-286   |
| HP       | 2621P  | TTY   | 4310     |
| HP       | 2631A  | TTY   | 4320     |
| HP       | 2640B  | TTY   | 4340     |
| HP       | 2645A  | Ven   | MD115-43 |
| HP       | 2647A  | Ven   | MD112-1  |
| I/S      | ADM-31 |       |          |

**Leasametric**  
Rent it and Relax  
**800-227-6773**

In Calif. call (415) 574-5797. Canada 1-800-268-6923

## DEC DISK DRIVES NOW AVAILABLE

- |                    |                    |
|--------------------|--------------------|
| 2- New RWP06AA     | 1- RJP04           |
| 2- RPO6AA          | 1- RPO4            |
| 3- RPO6AA          | 1- RJP03           |
| 4- RPO6AA          | 2- RPO3            |
| 12-RPO6 disk packs | 9- RPO3 disk packs |
| 4- RWM03AA         | 1- RL11AK          |
| 4- RMO3AA          | 1- RL01AK          |
| 11-RMO3 disk packs | 1- RL01 disk packs |

**DATA SYSTEMS SERVICES**

Buy-Sell-Lease

22842 Lambert  
Suite 408  
El Toro, CA 92630  
(714) 770-8024

WANTED!  
ALL

**NCR**  
MINICOMPUTER  
EQUIPMENT

250, 299, 399, 499, 775,  
7200, 7750 & 8200s



**SMITH ANDERSON CORP.**  
68-757 SUMMIT DR.  
CATHEDRAL CITY, CA 92234  
(714) 346-3227

**XEROX  
USERS**

WE

**BUY - SELL - REPAIR**

- COMPUTER SYSTEMS
- PERIPHERALS
- SUBASSEMBLIES AND SPARE PARTS

Call toll free  
**800-423-5321** Ext. 14 or 15  
in California  
**213-889-6031** Ext. 14 or 15

**TVM SHARE**

Equipment Support Division

## DATA GENERAL • DEC • SURPLUS SPECIALS

| DATA GENERAL   |                | DEC  |
|--|----------------|--|
| NOVA 4X<br>NOVA 3D<br>NOVA 1200<br>NOVA 210<br>ECLIPSE 5/20<br>ECLIPSE C/50          | CPU'S          | PDP 8<br>1103<br>1104<br>1105<br>1106<br>1107        |
| NOVA ECLIPSE   | MEMORY         | MM110P<br>MM110B<br>MM110L<br>MM110D                 |
| 6070-N 20 MEG SUBSYSTEM<br>6045 10 MEG DRIVES<br>6030 DUAL FLOPPIES<br>6060-A 96 MEG | DISKS          | RK08<br>RK09<br>RK01<br>RK02<br>RK03<br>RK04<br>RK05 |
| 6030 6001000 GPI<br>6028-A SLAVE UNIT  | MAGNETIC TAPES | TMB11MA<br>TMB11EA                                   |
| 4251 COMMUNICATIONS CHASSIS<br>4284 SYNC LINE MUX<br>4256 DCU 90<br>4258 ALM 4       | COMMUNICATIONS | D211<br>DWT1   |
| 8803 CRT'S, D-100<br>8812 CRT'S, D-300   | TERMINALS      | VT52<br>VT100<br>LA100<br>LA30                       |

**BUYING OR SELLING, CALL:**

• DEC - Bryan Eustace 305-272-2338

• DATA GENERAL - Phil Thomas 305-272-2339

Thomas Business Systems, Inc.

**3270's**

AVAILABLE  
FOR  
SALE OR LEASE

3271/3272 CONTROLLERS  
3277 DISPLAY STATIONS  
3284/3286/3288 PRINTERS

3274 CONTROLLERS  
3278 DISPLAY STATIONS  
3287/3289 PRINTERS



**NF COMPUTER  
SALES & LEASING CORP.**

1211 W. 22nd St., Suite 424, Oak Brook, IL 60521  
Telephone 312-920-8181, Telex 208106 NFC OAKR

**SUN DATA WILL BUY YOUR OWNED OR LEASE-OPTION**

Call now — we'll pay cash.

We're Specialists In Packaging Systems  
**3/32/34/38**  
And Peripherals.

Try our MAINTENEX: Keep your present service by IBM but at up to 20% savings.

**CALL TOLL-FREE 800-241-9882**

15180 Atlanta Blvd.  
P.O. Box 6250  
Norcross, Georgia 30091

in Georgia call collect 404-449-6116

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

**CMI**AMERICA'S  
LEADING SPECIALIST  
SERVING THE USED MARKET**3033**Lease Financing and  
Purchase Leaseback  
New and Used  
Jack Shevillo**3032**WANT TO BUY  
With 3850  
September/October  
Jack Shevillo**3031**Lease  
Sale  
Purchase/Leaseback  
Bob Laurie**3031**WANT TO BUY  
Any Memory Size  
September/October  
Bob Laurie**3168**Short Term Leases  
Features/Memory  
Gary Smith**SYSTEM 3**Models  
12 and 15  
Dennis Pennington**3158**A/P's  
Bill Graham**3148 3138**Lease or Sale  
Immediate Delivery  
Bob Laurie**4341**We Want to Buy or  
Sublease Your Machine  
We have late '80  
Delivery Positions**3155 3145**  
**3135 3125**Buy/Sell/Lease  
Joe Romeo**COMMUNICATIONS**  
Buy-Sell-Lease  
IBM 3705  
IBM 3704  
Immediate Delivery Configured  
To Your Requirements  
Joe Romeo**SYSTEM 34**All Models,  
Upgrades and  
Peripherals  
Available Now!  
Forest Benaway**3278**3274/3276  
3741/3742  
3277's  
with any Keyboard  
Kay Richard**3880 3420**  
**3370 3411**  
**3350 3203**  
**3340 3211**Buy/Sell/Lease  
Pat Callahan**360/20**  
**Series 1**  
**1130**

Marie Bednarz

**CMI CORPORATION**  
Since 1969  
755 W. Big Beaver, 19th Floor, Troy, Michigan, 48064**(313) 362-1000****MARKETING**Dallas, Texas (214) 385-0806  
New Jersey (609) 645-7282  
Montreal, Quebec (514) 288-8455  
Windsor, Ontario (519) 258-8910  
Geneva, Switzerland Telex: 289073 CMI CH  
Paris, France Telex: 613910 CMI FR  
Hamburg, W. Germany Telex: 211897 CMIHH D**CMI FINANCIAL SERVICES**San Francisco (415) 392-4800  
Atlanta (404) 396-7575

Member CDA/CLA

The **DEC** Specialists**CASH PAID NOW**

NEW OR USED

**VAX • 11/70 • 11/60 • 11/34**

• CPU'S • SYSTEMS • COMPONENTS

**RPO6 RPO4 RMO2 RKO7s**

MJ11BE • MS11LB • DH11AD • DD11DK • TJE 16

WE ARE CASH BUYERS OF SMALL OR LARGE DEC INVENTORIES

CALL TOLL FREE

The **DEC** Specialists @ DATALEASE**(800) 854-0350**

OR WRITE

**DATALEASE**2770 East Regal Park Drive  
Anaheim, Calif. 92806  
(714) 632-4986**IBM PERIPHERALS**  
SALE OR LEASE

|                  |      |      |      |
|------------------|------|------|------|
| DASD             | 3310 | 3330 | 3340 |
|                  | 3342 | 3350 | 3360 |
| TAPE UNITS       | 3420 | 3410 |      |
|                  | 3400 | 3403 | 3411 |
| PRINTERS         | 3803 | 3811 | 3820 |
|                  | 3800 | 3821 | 3876 |
|                  | 3274 | 3272 | 3271 |
| CONTROLLERS      | 3505 | 3523 | 3540 |
|                  | 3501 | 3278 | 3277 |
| CARD I/O         |      |      |      |
| DISPLAY STATIONS |      |      |      |
| MICR             |      |      |      |

MOST ITEMS AVAILABLE FOR  
IMMEDIATE DELIVERY

Contact:  
Bernie Gast

**215-782-1010****Computer Marketing Inc.**  
7704 Seminole Avenue  
Phila., Pa. 19126

Buy • Sell • Lease

SYSTEM **3**  
Call collect: 404-252-7480IBM **34** or write:  
**32** **DATAMARC**  
6051 Rosser Road  
Suite 310  
Atlanta, GA 30328**BUY SELL LEASE****SYSTEM 3-32-34-38**  
**SERIES 1-5110**Available: S/34-E35-E34-C23-C24-D35  
5251-11, 5251-12, 5258-03**Communication:**3271, 3272, 3277, 3284  
3284, 3286, 3288, 3776  
3777, 3780, 3704, 3705**Peripherals:**3741, 3742, 129, 029, 059  
3715, 3717, 083, 514, 548  
3410, 3411, 3340, 3344GENE NICHOLL  
TOM KLEEFISCH  
**AMERITEX COMPUTER CORP.**  
8383 N. Stemmons Frwy., Suite 302  
Dallas, TX 75247 214/631-3116  
Formerly Gemini Computer Corp.  
and Computer Resources Ltd.**minicomputer exchange inc.****SIZZLING SUMMER SPECIALS**

|  |         |
|--|---------|
| DEC 11/23's - Immediate Delivery       | \$6,800 |
| Nova 1200 Jumbo, 32KW Core; APL; PF/AR | \$3,900 |
| Dataprinter Model V132C-600 lpm        | \$3,500 |
| Versatec 1100 A Printer/Plotter        | \$2,500 |
| Eclipse Split Sense 16KW Core          | \$1,100 |
| IBM Model 026 Key Punch                | \$ 75   |

Many other DG — DEC Systems  
and Peripherals available**CALL TODAY (408) 733-4400****TWX 910/339-9272**

For LEASE (We're sole owners)

**IBM 4341 Model L**  
**PROCESSOR & CONSOLE**

|                              |                   |
|------------------------------|-------------------|
| * HI-SPEED I/O Set           | * 3742 DATA SYST. |
| Lease price from \$500/mo.   | from \$3395       |
| * 029 All Models from \$1575 |                   |
| * 129-3 from \$2850          |                   |

**Special . . . While They Last!**

IBM 3742 \$3395. or Lease \$135. per mo. (based on 24 mo.)

**CALL GEORGE GILMAN**  
**I.O.A. DATA CORP.**Toll Free 800-221-8438  
N.Y. (212) 673-9300  
383 Lafayette Street, New York, N.Y. 10003



|               |               |               |               |               |
|---------------|---------------|---------------|---------------|---------------|
| buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap |
|---------------|---------------|---------------|---------------|---------------|

**DEC  
COMPUTER  
SYSTEMS AND  
COMPONENTS**  
for  
**VAX 11/780**

C.D. SMITH  
& ASSOC. INC.  
12605 EAST FREEMAN,  
SUITE 318  
HOUSTON, TEXAS 77015  
713/451-3112  
TELEX: 76-2547 CD Smith Hse



**TIGER COMPUTER**  
415 Madison Ave., New York, N.Y. 10017, (212) 532-1500

Available for Lease  
**4341-L  
4341-K**

Buy/Sell/Lease  
3350's  
3340's  
3344's  
3330's  
3420 Type III Models

3830-1's  
3830-2's  
3803-1's  
3803-2's

**370/168-J**  
w/5 meg  
Independent Memory  
Available immediately

**3031/  
3032/  
3033**  
Purchase/Leaseback

Sale or Lease  
**3310's  
New or Used  
3370's New**  
Available immediately

Business  
**3158-U34**  
Additional Memory Available  
10/15/80

Early Delivery  
**4331  
Model 2's**  
Avail. for Lease

Lease short term  
**3148-K w/ISC,  
Madrids  
3138-J**  
Available immediately

A TIGER INTERNATIONAL COMPANY

**FOR SALE OR LEASE  
SYSTEM 3/15**  
MODEL D24-256K  
SERIAL # 41028

COMMUNICATIONS FEATURE  
CHOICE OF PRINTERS  
3741 AND 3277'S  
3340 DISK  
5424 MFCM

AVAILABLE NOW  
WILL MODIFY TO SUIT

Computer Merchants Inc.  
75 South County Avenue, Chappaqua, New York 10914  
Member Computer Dealers Association (914) 236-9821

**WE BUY - SELL  
USED OEM  
PERIPHERALS**  
and  
**WANG LABS  
EQUIPMENT**  
CFR Associates, Inc.  
18 Granite St.  
Haverhill, MA 01830  
617/372-8536

**IBM  
3270**  
PRINTERS, TERMINALS  
& CONTROLLERS  
Please Call: (312) 943-3770  
Forsythe/McArthur Associates  
Inc.  
919 North Michigan Avenue  
Chicago, Illinois 60611

**We have available many  
IBM  
3740  
Systems**  
We buy & sell



**Pearl  
EQUIPMENT CO. INC.**

• IMMEDIATE DELIVERY  
• SHORT AND LONG TERM LEASES  
• PURCHASE / LEASE BACK PLANS  
• WE BUY • SELL • LEASE • SYSTEMS/M • SYSTEMS/DB  
CALL • STEVE HOUGH • DICK GEYER

**PEARL EQUIPMENT  
COMPANY, INC.**  
P.O. BOX 1009 • 4717 CENTENNIAL BLVD. • (615) 263-8702 • NASHVILLE, TN 37208

**ACM**  
Pioneer Computer Marketing  
214/630-6700

**BUY  
SELL  
LEASE**

- All IBM Systems  
370's  
43 XX's  
303 X's
- Peripherals
- Tapes
- Disks
- Card I/O
- Add on Memory

**PIONEER COMPUTER  
MARKETING**  
1165 Empire Central Place  
Dallas, Texas 75247  
214/630-6700

**IDS international data  
services, inc.**

**DEC  
SYSTEMS**  
PDP 11/70's,  
11/34's, 11/04's,  
11/03's & Peripherals  
**BUY & SELL**

(408) 738-3368  
telex 345 592

1020 Stewart Drive  
Sunnyvale, CA 94086

**SELLING**

System-3      Series One  
System-34      3270 Equipment  
System-38      All Data Entry Equipment

**vantage**  
Computer Marketing, Inc.  
2460 Southwell  
Dallas, Texas 75229  
214/620-8380  
TWX 910-860-5060

**IBM Unit Record Equipment  
Disk Packs and Data Modules**

| Month Sale | Lease    | Month Sale  | Lease    | Pack          | Sale / Lease  |
|------------|----------|-------------|----------|---------------|---------------|
| 026 \$ 750 | \$35/mo  | 086 \$2750  | \$125/mo | 1916          | \$ 39 —       |
| 029 Call   | \$45/mo  | 129 Call    | \$110/mo | 2316          | \$ 99 —       |
| 082 \$ 750 | \$35/mo  | 548 \$1500  | \$ 60/mo | 3336-1        | \$149 \$10/mo |
| 083 \$1700 | \$60/mo  | 557 \$3500  | \$125/mo | 3336-11       | \$299 \$20/mo |
| 084 \$2750 | \$125/mo | 3742 \$3800 | \$175/mo | 3346-70       | \$699 \$60/mo |
| 085 \$1200 | \$60/mo  | 380/20      | Others   | Cartridge 338 | —             |

Other machines, packs, also available.

**Thomas Computer Corporation**  
600 North McClurg Court, Chicago, IL 60611 (312) 944-1401

**WE  
BUY • SELL • LEASE  
S/3  
MODEL 15/12/10**

**GSC** General Systems Corporation

2146 Livermore  
Troy, Michigan 48064  
Phone: (313) 689-6200  
Jerry Roberts  
Carole Solano

**— DEC MEMORY —**

**64KB — \$650**  
**128KB — \$1300**  
**256KB — \$2600**  
**512KB — \$5200**

Your choice, one price:

- Q-BUS
- UNIBUS
- VAX

Terms, cash in advance. Delivery 15 days A.R.O.  
Offer Good through Sept. 30, 1980  
Call Bea Ramos 1-800-538-8510  
In California 408/736-6876  
**NATIONAL SEMICONDUCTOR CORP.**

**BUY — SELL — LEASE — BROKERAGE**  
Let the  
"NATIONS LARGEST WHOLESALE DEALER"  
Buy, sell, lease, sub-lease, or be your agent in placement  
of your pre-owned IBM 360/370/System 3, or other units  
**COMPUTER INTERNATIONAL LTD.**  
CWC's international division—  
experts in foreign markets, freight, customs  
**BEACH COMPUTER CORPORATION, CWC's Leasing Division**  
**COMPUTER WHOLESALE CORP., (504) 581-7741**  
SUITE 507/508 FIRST NATIONAL BANK OF COMMERCE BLDG.  
NEW ORLEANS, LOUISIANA 70112  
MEMBER OF COMPUTER DEALERS ASSOCIATION

buy sell swap

## DISKS — TAPES — PRINTERS

|               |               |               |               |               |
|---------------|---------------|---------------|---------------|---------------|
| buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap |
|---------------|---------------|---------------|---------------|---------------|

**3310  
3370**  
Disk Drives  
Immediate  
Delivery  
call  
Bob Bardagy  
**312-698-3000**  
Or Your Local Office  
**COMDISCO**

**DEC 1-Day Ship**  
**11/60**  
ALL PDP11/70/45/40/35/34/20/15/10/05/03  
**A AMERICAN USED COMPUTER**  
P.O. BOX 68, KENMORE STATION, BOSTON, MASSACHUSETTS 02115  
**CALL (617) 261-1100**

**Series/1**  
**Discounts**  
■ Equipment 5%  
■ Maintenance 15%  
All new from IBM.  
Attractive lease plans.  
**DATELEASE CORPORATION**  
The IBM small systems financing specialists  
Westport, CT • (203) 226-9582  
Cumberland, RI • (401) 333-0240  
Atlanta, GA • (404) 465-1480  
Marlton, NJ • (609) 983-0936

**IBM 370/158 CPU**  
**IMMEDIATE AVAILABILITY**  
**SUBLEASE THROUGH**  
**NOVEMBER 1981**

Model 1KJ 3Meg IBM Memory  
Features: 1433, 2150, 2151, 4650, 6111  
7730, 7840, 9318-3213  
Console Printer

For Sale or Lease: Lease through  
November 1981  
2 Meg. National Semi Conductor  
Memory for 370/158

For Sale: 3348 70F Data Modules  
Don Reneau  
(405) 528-3141 ext. 282

**TG&Y**

BUY • SELL • LEASE

**370/115  
370/125**  
Call John Ferguson

**370/135  
370/138**  
Call Mike Nelson

**370/145  
370/148**  
Call Ken Bouldin

**S/3**  
**MODEL 8  
MODEL 10  
MODEL 12**  
Call Roger Odom

**MODEL 15**  
Call Jack Goodman

**SWA South West Automation**

**AVAILABLE NOW**  
11/34-A Systems — New & Used

|                            |           |
|----------------------------|-----------|
| (13) VT100's               | 2000 ea.  |
| (15) H960-CA               | 1600 ea.  |
| (1) LA 180 printer         | 2000 ea.  |
| (1) M7258 controller       | 600ea.    |
| (1) PDT-150/w VT 100       | 8500 ea.  |
| (4) PDP 11/03w/RX01        | 7000 ea.  |
| (1) Data Genrl. Micro/Nova | 6000 ea.  |
| (4) DZ11 A                 | 2350 ea.  |
| (10) MS11JP                | 900 ea.   |
| (1) PDP 11/03w/RK F&J      | 12500 ea. |
| (15) BA11KE                | 3000 ea.  |
| (20) DD11CK                | 420 ea.   |
| (5) DD11CF                 | 420 ea.   |
| (7) KE11E                  | 1200 ea.  |
| (2) TWE16 Tape Drive       | 16000 ea. |

**MANY OTHER MISC. ITEMS**

**HOME OFFICE**  
1113 Ave. B — P. O. Box M  
Katy, Texas 77448  
(713) 371-8288

**WEST COAST OFFICE**  
1175 Tatum Drive  
Sunnyvale, Calif. 94086  
(408) 734-1117

**WANT TO BUY**  
**3420/008**  
**with feature 6425**  
**(Dual Density)**

**Contact C.C. Elders**  
DAC Buys Rental Credit Equipment  
Call or Write  
**DATA AUTOMATION CO., INC.**  
4858 Cash Road  
Dallas, Texas 75247  
214/637-6570  
Member of Computer Dealer Association

**Short or Long Term**  
**Leases From**  
**RANDOLPH**  
**4300's**  
**303X**

...and all 370 CPU's  
and peripherals

**800-243-5307**



**Randolph Computer Company**  
Division of The Bank of Boston  
537 Steamboat Rd., Greenwich, Ct 06830  
(203) 661-4200



**3742**  
Call Gayle Drotar

**S/34**  
Call Roger Odom  
IBM Maintenance Guaranteed

**TAPE**  
**3411-3410**  
**3420**  
**DISK**  
**3340-3344**  
**3350**  
Call Bob Ford

**ECONOCOM**  
1755 Lynnfield Road  
P.O. Box 17825  
Memphis, Tennessee 38117  
901-767-9130  
Member CDA

**SALE BY OWNER**  
**IBM System/34**  
128K, CPU and 64 MB disk. 5.5251 display stations, 1 of which is a Model 12. 1 5211, 300 line per minute printer and 2 5256 character printers. This system has telecommunications. Units have been on IBM maintenance and can be certified. Willing to sell all of the package or separately. **CONTACT:**  
**Black & Webster**  
281 Winter Street, Waltham, MA 02254  
(617) 890-9100



buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

S/32

S/34

S/3

S/38

BUY • SELL • LEASE



COMPUTER OPTIONS, INC.

The Best Option  
in IBM Computers

2850 Metro Drive  
Minneapolis, Mn.  
55420

800 • 328 • 1939  
612 • 854 • 5870

4341L

Nov. 21 Ship

3370's

1A1 / 3B1—Nov. 21  
2A1 / 6B1—Dec. 26

4331-2

Dec. 26 Ship

Computer Concepts, Inc.  
6443 S.W. Beaverton Hwy.  
Portland, OR 97221  
503/297-4741



### FOR SALE OR LEASE

2-MEMOREX 1270  
T.P. Control Units.  
EACH has  
2 channel switch  
and 64 Bsync lines.  
May consider selling  
some Bsync features.  
AVAILABLE 10-15-80.

Contact:  
COMPUTER RESEARCH CO.  
200 North Michigan Ave.  
Chicago, IL 60601  
800-821-2240  
(Ill. residents)  
312-877-7500  
ATTN: RON ELLIS



### BURROUGHS COMPUTERS

For Sale or Lease

B7700 Complete Dual  
Processor System  
B4700 Complete System  
B3500/B2700 Systems

IBM  
(NEW) 3101-12 CRT  
Terminals  
\$1,250.00 each

DSI, INCORPORATED  
2480 W. Alameda Ave.  
Denver, Colorado 80222  
(303) 922-8331  
Telex: 910-931-0483

Member: Computer Dealers Association

For Sale

8 Data General  
#8603 32 KB  
Core Memories.

Cur/list price \$4,500.00 per  
board. D.G. c-300, s-200, c-330  
and s-330 computer models.  
\$2,000.00 per board or make of-  
fer.

Call Dick Jalas  
414-255-1540

## SHORT TERM LEASES

138's, /148's, /158's, /145's

3330's, 3350's, 3420's

360/40's, /50's, /65's

Call Us Collect

### UNITED STATES

Boston: Eastern Regional Headquarters (617) 272-8110  
Arlington ..... (703) 521-0300  
New York ..... (212) 832-2622  
Philadelphia ..... (215) 293-0546

Austin: Southern Regional Headquarters (512) 451-0121  
Atlanta ..... (404) 768-6535  
Dallas ..... (214) 233-1818  
Houston ..... (713) 447-0325

Chicago: Central Regional Headquarters (312) 298-3910  
Pittsburgh ..... (412) 922-8920  
Detroit ..... (313) 961-1675  
Minneapolis ..... (612) 370-1153  
St. Louis ..... (314) 353-8285

San Francisco:  
Western Regional Headquarters (415) 283-8980  
Los Angeles ..... (213) 670-7994

CANADA  
Toronto ..... (416) 366-1513

### BROKER/DEALER SALES AND LEASING

166, 303X ..... Chuck Smith  
135, 145, 155 ..... Dave Revere  
138, 148, 158 ..... Keith King  
Peripherals ..... Craig West  
Communications & ..... George Beck  
Terminals ..... Sandy Mitchell  
OEM Memory .....  
360 .....

Phoenix: (602) 248-6848



GREYHOUND  
COMPUTER CORPORATION  
800-528-6113

Greyhound Tower Phoenix, Arizona 85077

WE  
BUY, SELL,  
LEASE  
IBM®

SADDLEBACK  
MARKETING  
CORPORATION

1400 NORTH BRISTOL, SUITE 170  
NEWPORT BEACH, CA 92660  
PHONE: (714) 833-9800  
TWX: 910-555-2550

## WANTED

3540-B2's 3420-7's  
3880-1's 3505/3525 w 1421 print

## FOR SALE

Memorex disk 3675's  
3333 Mod 11 3330 Mod 11  
3333 Mod 1 3420 Mod 5's

### M.S.I. DATA RECEIVER CONFIGURATION

- For Sale or Lease including:
- Model 3040 data station/9 TRK
  - 800 BPI/Blue tape drive
  - 8K memory
  - 3124 Char-Sync line controller
  - 3195 IBM System/3 channel
  - Teletype 33KSR FF
  - 202C data set access w/auto answer
  - On maintenance continuously

Available Oct. 31, 1980 ... We Will Deal!

Call or write:  
Harris Data Service, Inc.  
11629 West Dearborn Ave., Milwaukee WI 53226  
(414) 475-1767

### HEWLETT PACKARD 3000 FOR SALE

Series 33 w/256Kb  
also includes  
(2) 7925 disk drives  
(1) 7970 1600 bpi tape drive  
(1) 2608 400 lpm printer  
(3) 2645 CRT terminals

call  
BROOKVALE ASSOCIATES  
800/845-1167 510/567-7777

## DEC TERMINALS NOW Immediate Delivery

DEC  
VT100

DEC  
LA120

FOR SALE OR LEASE

Dataseal 800-854-0350  
Terminals & IN CALIF.  
Communications 714-632-6986

2770 REGAL PARK DR., ANAHEIM, CALIF. 92806


DTC is a  company

Buy • Sell • Lease

3 32 34 38

All IBM Peripherals

CALL COLLECT! 901/372-2622

 COMPUTER BROKERS, INC.  
2978 Shelby St. • Memphis, Tennessee 38134

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

**DEC  
EQUIPMENT  
FOR SALE**

RM03      RK06  
RP06      RK07  
RP04  
AVAILABLE  
IMMEDIATELY  
**SYSTEM  
INDUSTRIES**  
408 732-1650 ext. 216  
ASK FOR S.I.T.E.

**BRAND NEW - AVAILABLE IMMEDIATELY  
DISC DRIVES**

Limited Quantities

Controllers and System Integration Also Available

- Control Data 80 MB SMD's - \$6000 each
- Control Data 300 MB SMD's - \$10,500 each
- MEMORY**
- Megabytes of add-in VAX - \$8160/MB
- Add-on 11/70 with 1 MB semi-memory - \$14,000

**TECHNICAL COMMODITIES CO.**  
"We broker over-inventoried accounts"  
Call 617/876-3739

**UNIVAC 90/30  
SUBLEASE  
LARGE DISCOUNT**

Available from User  
Includes  
164K Memory  
(4) U200 Terminals  
(4) 8418 Disks  
(2) U10 Tapes  
717 Reader  
719 Punch  
776 Printer  
Communications Adaptor  
**October 15  
DELIVERY**  
Send inquiries to:  
Consultron  
927 Pershing Drive  
Silver Spring, Md.  
20910  
(301) 589-8834

**EQUIPMENT  
AVAILABLE**

| Description  | For Sale/<br>Lease                           | Date                  |
|--|--|-----------------------|
| <b>370/158</b><br>158-U32 (ISC and Madrida)<br>158 Memory — 1 meg (CDC)<br>M upgrade and 3058 for 158<br>1435, 2150, 6111, 7840,<br>1850, 3213 | lease only<br>sale or lease<br>sale or lease | 9/01/80<br>now<br>now |
| <b>370/168</b><br>168 Memory — 2 megs (IBM)<br>2860 — 3  | lease only<br>lease only                     | 8/01/80<br>now        |
| <b>370/145</b><br>0983, 6984   | sale or lease                                | now                   |
| <b>Other</b><br>2835 — 2<br>2305 — 2   | sale   | 8/01/80               |

CONTACT:

**LFC**

Jack A. Northrop  
Lease Financing Corporation  
3 Radnor Corporate Center  
100 Matsonford Road  
Radnor, Pa. 19087  
215/527-4450

**Inflation Fighters****Quality & Savings**

Slightly used, Money Back Guarantee.  
Full Reels. All External Labels Removed  
Guaranteed for use at 1800 BPI through  
8250 BPI.

2400' Reel \$4.95 ea.  
1200' Reel \$4.25 ea.  
600' Reel \$3.50 ea.

All Tapes with Hanging Seals  
We pay freight on orders over 200 tapes  
All orders shipped within 48 hours

Call or Write

**Computer Tape Mart**  
169 B New Highway  
Amityville, New York 11701  
[516] 842-8512

**WE BUY****158 & 168****MEMORY****transdata**

214/631-5647

**DATA GENERAL  
SPECIALISTS  
FOR**

Surplus New & Used  
Equipment & Systems  
with full depot repair facilities.

CALL US  
WE TAKE THE TIME.  
— WE CARE —

**JM Associates**

801 W. Chapel Avenue — Cherry Hill, NJ 08002

609-663-1115

BUY • SELL • LEASE • TRADE

**Systems****3/32/34/38**

CALL FOR A QUOTE  
(612) 333-6476

**NORTHERN  
GROUP**  
2124 10th CENTER  
MINNEAPOLIS, MN 55402

System 34's  
3 year leases  
below 18M

**DIEBOLD  
COMPUTER LEASING  
BUY • SELL • LEASE**

**ALL CPU's &  
PERIPHERALS**  
**360      303X**  
**370      4300 Series**

**IBM**

CARD READERS & PUNCHES  
PRINTERS  
CONTROLLERS  
AVAILABLE NOW

**DIEBOLD**

CALL 800-631-1602      201-569-3838  
TWX 710-991-9733

177 North Dean Street, Englewood, New Jersey 07631  
Member: Computer Lessors Association  
and Computer Dealers Association

**DEC  
AVAILABLE IMMEDIATELY**

DISK DRIVES    CPU    OPTIONS    TERMINALS  
RL01 RL02 RK06 11/23 11/34 DZ11 DH11 VT52 LA120  
RK07 RP04 RP06 11/70 DR11 DL11 LA180

OTHER ITEMS IN STOCK. CALL FOR QUOTE.

**NATIONAL COMPUTER****EXCHANGE**

6960 ARAGON CIRCLE, STE. 5, BUENA PARK, CA 90620  
(714) 522-1870

**DEC EQUIPMENT FOR SALE**

1 — 11/34ADE    1 — RK06EQ  
5 — VT52AE    1 — RK611FA  
3 — VT100NA    1 — M8728 (New 256KB MOS Memory 11/70)  
2 — LP05    4 — DZ11-E (New equivalent)  
5 — LA36HE    5 — H960CA (New equivalent)  
2 — RP04AA

Subject to prior sale

Call Frank Dragovits  
**800-423-5321** Ext. 14 or 15  
In California  
**213-889-6031** Ext. 14 or 15

**TYMSHARE**

Equipment Support Division

**PDP 11/40**

with (4) RP02 drives  
and (2) RK05 drives  
112K words memory  
DZ11E 16 line MUX  
RSTS/E-7A datatrieve  
V.02 BASIC +2

Available about Sept. 30, 1980

Call Bruce Gullekson toll free  
800/528-4568 with offer.  
Phoenix, Arizona.

**Dealers in: IBM PROCESSORS/  
PERIPHERALS**

3/32    34/38    360/370    4300    303X    SERIES 1    33XX    38XX  
**data3**    Computer Corporation    CALL TOLL FREE  
114 Central Avenue    1-800-328-3537  
P.O. Box 1000, Burlington, MA 01803    or 617-681-4384 collect

**370/125'S  
370/115'S****For Sale • Lease • Purchase****\*Purchase Leaseback**

Short Term Leases Available    Also all Peripheral Units.

**CORPORATE COMPUTERS, INC.**  
(203) 661-1500    Member CDA

115 Mason St., Greenwich, CT 06830  
Member Computer Dealers Association

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

# O.P.M. LEASING SERVICES, INC.

## The Custom Leasing People

### Branch Offices

|                              |                |
|------------------------------|----------------|
| ATLANTA                      | (404) 953-0926 |
| BOSTON                       | (617) 749-4844 |
| CHICAGO                      | (312) 945-8150 |
| DALLAS                       | (214) 641-7870 |
| DENVER                       | (303) 499-4488 |
| DETROIT                      | (313) 996-5811 |
| HOUSTON                      | (713) 367-1668 |
| KANSAS CITY                  | (816) 474-8106 |
| LOS ANGELES                  | (213) 278-4117 |
| MINNEAPOLIS                  | (612) 884-9980 |
| NEW JERSEY                   | (201) 635-1092 |
| N.Y. FINANCIAL DISTRICT      | (212) 747-0220 |
| ST. LOUIS                    | (314) 434-6330 |
| SAN FRANCISCO                | (415) 383-4111 |
| WASHINGTON, D.C.             | (202) 656-8676 |
| <b>International Offices</b> |                |
| LONDON                       | 01-222-4031    |
| PARIS                        | 331-775-0511   |
| COLOGNE, GERMANY             | 221-763-1458   |



### Corporate Headquarters

O.P.M. LEASING SERVICES, INC.  
71 BROADWAY, NEW YORK, N.Y. 10006  
(212) 747-0220  
TWX: 710-581-5223 OPM LEASE/NYK

## Short and Long Term Lease Plans Available

### CPUs

370/135  
370/145  
370/155  
370/165

All Configurations  
Available For  
Sale or Lease

303X  
Series

Purchase/Leaseback  
of Installed  
or OPM Supplied

370/158  
370/168

All Configurations  
Available For  
Sale or Lease

4300  
Series

All Configurations Available  
For Sale or Lease  
"Subject to adherence to  
IBM's order certification pro-  
cess"

370/138  
370/148

All Configurations  
Available For  
Sale or Lease

Amdahl  
All Models  
CDC Cyber 74  
Univac 1100 Series

All Configurations  
Available For  
Sale or Lease

### FEATURES/MEMORY

370/158 & 168  
ISC/Madrids  
All Channels

For Sale or Lease

IBM Memory:  
370/158s, 168s, etc.  
or 3000 Series  
Machines

For Sale or Lease

OEM Memory:  
155s, 158s, 168s,  
either EM&M, NSC,  
Intel or STC

For Sale or Lease

### PERIPHERALS

3333/3330s  
3350s  
3830s

All Configurations  
Available For  
Sale or Lease

3803 Controllers  
3420 Tapes

All Models and  
Configurations  
Available For  
Sale or Lease

3211/3811  
1403/2821

All Configurations  
Available For  
Sale or Lease

## Complete Installation and Planning Support Provided

### DEC NOW

11/34A-LE84KB, DL11, KY11... NEW  
Vax Systems... CALL  
11/23A or Display Systems... NOW  
11/04, RL01 System... \$19,000  
11/34 systems... NOW  
11/70 W/RP08's or RP03's New and  
Used... NOW  
Peripherals, disc tape, and boards  
VT100... \$1,900.00

### WANTED FOR CASH

any and all DEC systems and peripherals.  
All inquiries immediately answered

**DATAWARE**  
SYSTEMS LEASE, INC.

30 Bay St.  
Staten Island, N.Y. 10301  
(212) 447-4011  
Telex 429284

### September Special FOR SALE

| Machine | Model | Price   |
|---------|-------|---------|
| 026     | 001   | \$ 500  |
| 029     | A22   | \$ 1500 |
| 029     | B22   | \$ 1700 |
| 083     | APER  | \$ 5000 |
| 108     | 001   | Offer   |

Terms: Cash, F.O.B. URS

Availability: 30 days

Maintenance:

IBM acceptable

Tom McHugh

or Bob Luck

URS Since 1959 (617) 438-4300

86 Montvale Ave.

Stoneham, MA 02180

### FOR SALE NCR 7750 DDPS

#### Includes

- (2) 8230 Processors with 128K memory ea.
- (1) 6420 600 LPM Printer
- (1) 6560 9.8 MB Disk
- (5) 7750 12-pocket proof stations
- Under NCR maintenance

CONTACT  
Dan Medley  
(314) 961-1232

# DEC

### Specialists in DEC Systems and DEC Compatible Add-Ons

|               |          |                      |          |
|---------------|----------|----------------------|----------|
| DRP06-200MB   | \$14,995 | DRWM05-300MB         | \$25,995 |
| DRJP06-200MB  | \$21,995 | DZ11's-Many-From     | \$ 1,495 |
| DRWP06-200MB  | \$23,995 | 128KB MOS            | \$ 2,395 |
| DRM02-3-80MB  | \$ 8,995 | 256KB MOS            | \$ 3,995 |
| DRJM02-80MB   | \$15,995 | DTU45 & Controller   | \$ 9,995 |
| DRWM03-80MB   | \$17,995 | M7850-Many           | \$ 595   |
| DRM04-5-300MB | \$16,995 | Systems-Many-34-70's |          |
| DRJM04-300MB  | \$23,995 |                      |          |

### DEC

#### FOR SALE

CH11AD 11/04DM  
VT100 11/23AA  
LA34 MK11CE  
DUP11DA MJ11BE  
DL11C WB MS11LB  
DD11CK, DK DZ11A  
RM03 DR11C  
RK05JF MS11JP  
RL01.02 H800CA  
LA11PA DM11DC  
DB11A DM11BB  
MR11EA B411KE  
CABLES-BC050, D BC03L, M  
& UNIBUS  
DISK PACKS-RL01, RM03

Western Data Systems  
213/775-0223  
PO Box 7000-152  
Redondo Beach, CA  
90277

### TD 832's WANTED

Wilson Business  
Machines, Inc.  
24565 Hallwood Court  
Farmington Hills, MI 48018

ATT: JoAnne  
313/478-7700

## 4341-L

OUR OWN POSITIONS

10-3-80 12-26-80

2-20-81

CENTRON-DPL

612-884-3366

## DATA SYSTEMS SERVICES

Buy-Sell-Lease

22642 Lambert  
Suite 408  
El Toro, CA 92630  
(714) 770-8024



buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

# 4331- L02 4 MEG

SHIP:  
OCT. 1980  
212-273-6094

## WANT TO BUY 3420-8 TAPE DRIVES

BLUEBONNET COMPUTER CO.  
1214 West 5th St.  
Austin, TX. 78703  
512/476-9362

## DEC SPECIALS ALL NEW 11/34A SYSTEM (DATA SYSTEM 355) INCLUDES (2) RL01's (1) LA 180, (1) VT 100, CABINETS, WORK STATION

**\$29,000**  
RL02 - \$5200  
VT 100 - \$1800  
LA 120 - \$2500  
**FROM STOCK!**  
**DATAWARE**  
SYSTEMS LEASE, INC.  
30 Bay St.  
Staten Island, N.Y. 10301  
(212) 447-4911  
Telex 429394



• MEMOREX PERIPHERALS  
Buy, Sell or Lease  
• EQUITY AVAILABLE  
**PCL FINANCIAL CORP.**

239 Glenville Road  
Greenwich, Conn. 06830  
(203) 531-4800  
Edward J. McKelvey

SALE

PURCHASE

## DATA GENERAL COMPUTER SYSTEMS & PERIPHERALS FOR SALE

60K/3/0160/0080 CRT's  
6045 10MB Disk System  
6050A 66MB Disk Drive  
Micro Nova System 50% off  
Comm Chassis & ALM-8  
NOVA 3 Systems  
MP100 & MP200 Systems

5/120 System including:  
182KB Memory, Floating Point  
95 MB Disk Subsystem  
Magnetic Tape Subsystem  
Comm Chassis, ALM-8  
DCU 50, CRC, 2 Bay Cabinet  
300 LPM Line Printer

**AMES SCIENCES, INC.**  
301/397-3140

FOR SALE BY OWNER

## (4) 3310 DISK DRIVES

Two A2's Two B2's Available Immediately  
FOR INFORMATION, PLEASE CONTACT BOB STOKLEY

**Johnson Systems, Inc.**

McLean, Virginia  
703 821-1700



- Save you thousands of dollars
- Deliver quickly
- Take trade-ins

System/34, System/32,  
System/3, All peripherals and  
upgrades too.

Cass Marketing Services Inc., 535 N. Brand Blvd.,  
Suite 838 Glendale, CA 91203 • (213) 956-4982

CDS Distributed Systems

MAILING  
LABELS  
(2000 Listings)  
For EDP Facilities and  
Key Decision  
Makers  
in North Texas

For information on this or  
other marketing services  
call or write:  
P.O. Box 1947  
Richardson, Texas 75080  
(214) 934-9940

**CMIT**  
AMERICA'S  
LEADING SPECIALIST  
SERVING THE USED MARKET!

## 303X MEMORY

Purchase/Leaseback  
Jack Shevillo

**CMIT CORPORATION**  
(313) 362-1000

DEC

Now Available

T.I.

VT100 • VT132  
LA34 • LA38  
LA120

**DEC  
VT100**

810 NO  
820NO 743 820K30 785

DATAMEDIA

As Low As

OTHERS

0780/1 0780/IL  
0780/3 0780/OL  
1021A 3025A  
3048A 3082A  
3053A 4000A

**\$1545.00**  
**Command, Inc.**  
7690 Keno Rd. • Suite 200  
Indianapolis, IN 46250  
317-842-3900

Hardware  
1552  
ADM3A • ADM3A+  
ADM31  
Teletype 43

## BUY/SELL/LEASE Immediate Delivery

3276 — Model 2 & 12  
3278 — Model 2  
3287 — Model 1 & 2  
3289 — Model 1 & 2

**WANTED**  
3276-2 w/8K0731

**NEU-COMP. CO.**  
11 N. Arlington Heights Rd.  
Arlington Heights, IL 60004  
(312) 382-0720

## FOR SALE

### Decision Data 9610

96 column card programmable  
interpreting keypunch.  
Under maintenance contract.

5 years old

Original cost \$7700.  
All reasonable  
offers considered.

Contact:  
Steve Lemly or Ivan Juric  
703/838-8000

## DEC EQUIPMENT FOR SALE

RPOB RPOB RPOB RPOB RPOB  
RPOB RPOB RPOB RPOB RPOB

Controllers available for VAX, 11/70 and  
other PDP-11s.

Processors: 11/70, 11/80, 11/45,  
11/24, 11/23

Memory: MK11-BE, MK11-CE,  
MS11-LD, MS11-LB

Tape: TWE16, TU10

Printers: LP11, LA180

Terminals: VT100, VT52,  
LA120, LA38

Comm: D211-A, DM11-AD

Card Rdr/Pwr: CT811-KM

Backup: DD11-DK, DD11-CK

Carl R. Beehne & Assoc., Inc.  
Specialists in Digital Engineering  
408/727-2886

## (2) IBM 4341-L1

with 3880/3370

Available Dec. '80

and Feb. '81

## (1) IBM 4331-K2

March '81

Contact Nelson Strickland  
Ames Group Inc.  
4500 Campus Dr., Ste. 500  
Newport Beach, CA 92660  
714/857-0721

## FOR SALE

7 Months Old

## BC7-700 PROCESSOR

With 10 million bytes of  
disk storage.  
Includes two work  
stations.  
RPG II

714/272-1202

## FOR SALE OR LEASE

3741s/3742s

3704s/3705s

## System 34-F37s

Dedicated to service with integrity

**METROPLEX COMPUTER COMPANY, INC.**

5125 John Carpenter Freeway  
P.O. Box 47100, Dallas, Texas 75247

(214) 634-2750 MEMBER  
TWX: 910-881-4171

## 370-145

All Models

for Lease

Very reasonable

**Brixton**

516/248-0250

## WANTED

TO BUY

**SPERRY UNIVAC**

BC7/-865

DISK DRIVE

MODEL 9408-00

10 or 20 meg.

CONTACT K. DANIELS  
HYGENIC CORPORATION  
1245 HOME AVE.  
AKRON, OHIO 44310  
1-800-321-2135

## WANTED:

Used Data

General Equipment

(less than two years old).

Nova 4/X w/128 KB (8395-K)

Mag tape 800 BPI 75 IPS 9-T

(6021)

12.5 MB disk (6099)

285 CPM card reader (4016D)

Call Rob Taylor or Donna Geib

(201) 573-1400 or write to: Lun-

ing Prak Associates, Inc., 200

Summit Avenue, Montvale, NJ

07645

## WE BUY, SELL, AND INSTALL NEW AND USED COMPUTER ROOM FLOORING

Raised Floor Installation, Inc.  
19 Seaborg St.  
Clifton, N.J. 07013  
(201) 778-2444 in New Jersey  
(212) 594-4039 in New York  
(415) 546-9466 in California

## 4341

- Systems Available
- For Lease
- 4th Quarter 1980
- Deliveries

**COMDISCO**

CALL YOUR LOCAL OFFICE OR  
KAREN JOHNS

312-698-3000

## DEC VAX SYSTEMS MEMORIES AND PERIPHERALS IMMEDIATE AND SHORT TERM DELIVERIES

call:  
**BROOKVALE ASSOCIATES**  
800/645-1167 516/567-7777

## WANTED DATA PRODUCTS LINE PRINTERS

CALL (800) 527-3723

**PINZONE & ASSOCIATES**  
3322 STOVALL STREET  
IRVING, TEXAS 75061

## For Sale By Owner

**NCR 201 CPU**

Has all features

128K memory

thermal IO

300 CPM reader

640-202 H.S. printer

3000 LPM

164 characters/line

**NCR 625 Disk Controller**

High density

(2) NCR 657 Disk Cabinets

2 buckets each, total 180MB storage

System under

continuous NCR maintenance.

815/333-5108  
Compulect, Inc.

| buy sell swap  | buy sell swap   | time & services   | time & services   | time & services |
|--|---|---|---|-----------------|
| <b>FOR SALE</b><br><b>NCR I-8250</b><br>1 8250 Processor, 96KB<br>1 8010 Cabinet<br>2 6880 Rack Mounted Disk Drive<br>1 7821 Cassette<br>1 6440 Matrix Printer 128LPM<br>1 6440-1020 Common Trunk Interface<br>3 8796 CRT<br><b>LEADING STRATEGIES, INC.</b><br>91 EAST 28TH STREET<br>NEW YORK, NEW YORK 10016<br>(212) 683-8855        | <b>SANDERS</b><br><b>MEDIA 12/7</b><br><b>PRINTER</b><br>TRACTOR FEED<br>4 TYPE FONTS<br>RS-232 INTERFACE<br>\$3,600.00<br><b>C. JOHNSON</b><br><b>801-489-9432</b>   | <b>Computer Services</b><br><b>370/158-3</b><br>VS1 - CMS - DOS<br>REMOTE JOB ENTRY<br>INTERACTIVE COMPUTING<br>TURNKEY SYSTEMS<br>PACKAGED PROGRAMS<br>(201) 777-3454<br>15 Minutes from Lincoln Tunnel<br>One Passaic Street<br>Wood-Ridge, N.J. 07075                            | <b>MEMORY &amp; COMPUTER REPAIRS</b><br>ANY MANUFACTURER'S<br>MEMORIES<br>CORE — SEMI<br>DEC® — DATA GENERAL<br>COMPLETE CPU'S AND<br>MEMORIES<br><b>THREE DELTA CORP</b><br>1038 Kiel Court, Sunnyvale, CA 94086<br>(408) 734-2680<br>TWX-910 339-9511   |                 |
| <b>THIS SPACE FOR HIRE.</b><br>[Inquire at Classified Advertising Dept.]   | <b>I.B.M. 360-40</b><br>All Shifts, 128K, 4-2401<br>MOD-2, 9-2314, 1403-N1,<br>2540, 1401 Compatibility.<br>From \$35/Hour<br>Restaurant Associates, Inc.<br>1540 Broadway<br>New York, N.Y. 10036<br>Contact:<br>Al Palmo (212) 997-1413<br>Charles Leiby (212) 997-1411   | <b>IBM System 3/12</b><br><b>For Sale By Owner</b><br>5412 Processor 80K<br>3340 Disk Drives<br>5203 Printer 300 LPM<br>5424 MFCU 250 CPM<br>(5) 3277 Display Stations<br>Complete or Partial Package<br>Contact<br>Paul Sturges<br>Word of Life, Inc.<br>518/532-7111              | <b>FAST DEPENDABLE BOARD REPAIR</b><br>Data General      Interdata<br>DEC                  Computer Auto<br>Data Products      Diablo/CDC<br>* 7 DAY TURN-AROUND<br>* "RACE" (24 hour) SERVICE<br>* 60 DAY FULL BOARD WARRANTY<br><b>MNI</b> MINI-MAINTENANCE, INC.<br>3020 LINCOLN CT., GARLAND, (DALLAS) TEXAS 75041<br>1-800-527-4641 TWX 910 888-5088<br>CONTACT: CHUCK MITCHELL                            |                 |
| <b>FOR SALE</b><br>IBM 370/138 CPU (1-MB) AND<br>CONSOLE; IBM 3704-A02<br>Communications Controller;<br>ITCL (2) 7330-11, (4) 7330-10<br>Disk Drives and 7833 Control-<br>ler. Offered by: Waubesa<br>Community College,<br>N.S. Hopp, Director of<br>Purchasing, Sugar Grove,<br>IL (312) 486-4811.                                     | <b>TIME &amp; SERVICES</b>  |   | <b>COMPUTER TIME</b><br><b>370-148J</b><br>DOS-VSE/RJE/CICS/VOLLIE<br>Excellent Availability All Shifts<br>Remote Processing or "HANDS<br>ON"<br>For Top Priority Scheduling Call<br>DOUG GREENE at:<br>(212) 688-3388<br><b>ICS</b><br>One Park Avenue<br>New York, N.Y. 10016   |                 |
| <b>FOR SALE</b><br><b>DEC (NEW)</b><br><b>DATA SYSTEM D355</b><br>PDP-11/34A CPU<br>128kb MOS MEM<br>RL11- Controller and 5mb Disk<br>RL01- 5mb Disk<br>LA180- DEC Printer<br>DZ-11- 8 Line Mux<br>4/VT100- Decform CRT's<br>CTS300- Software<br>RT-11V38- Operating System<br>CABINETS & DESK<br>CALL: (313) 476-7080<br><b>FRANCES</b> |   |   | <b>QANTEL</b><br><b>SOFTWARE SUPPORT</b><br><b>EAST COAST</b><br>Training, Marketing<br>Software Installation<br>24 hr Trouble Shooting<br>Cioplan, Report Generator,<br>Advanced Program Generator,<br>204/404 OS, etc.<br>Call or Write:<br>William J. Brown<br>894 Ridgeway Av.<br>Rochester, NY 14615<br>716-254-0488   |                 |
| <b>FOR SALE OR LEASE</b><br>4341/L Processor<br>370/138 J Processor<br>3420/5 Tape Drive<br>3333 DASD<br>3830/2 Control<br>Forsythe/McArthur Associates, Inc.<br>919 North Michigan Avenue<br>Chicago, Illinois 60611<br>(312) 943-3770  | <b>TIMESHARING</b><br><b>SAVE 50% AND MORE ON</b><br><b>CMS, TSO, ETC</b><br>As computer time brokers,<br>we offer reliable timesharing<br>services provided by large lo-<br>cal service bureaus. These<br>local service bureaus are now<br>able to compete with the na-<br>tional timesharing firms<br>through Tymnet and Telenet.<br><b>Computer Reserves, Inc.</b><br>(212) 599-0770<br>(201) 678-1881 |   | <b>WANTED TO RENT</b><br><b>DEC TIME</b><br>Interested in renting about 6<br>hours weekly on PDP-8 or<br>11/03. N.Y.C., No. Jersey, or<br>Long Island area.<br>Call<br><b>201/460-8624</b>  |                 |
| <b>FOR SALE</b><br><b>END USERS ONLY</b><br>I.B.M. 370-145 2MB<br>3340-44 Disk Drives<br>3803 and 2 3420-7 Tape Units<br>3272 Control Unit<br>3540 Diskette Reader<br>2821 Control Unit<br>1403 Printer (P/N Train)<br>Available January 81<br>For More Information, Contact<br><b>Fred Paine</b><br>(813) 371-0811                      | <b>MCC</b> Maritime Computer Corporation<br>370/145      4331<br>• DOS/VSE<br>• RJE<br>• CICS<br>• GRASP<br>Time Available All Shifts<br>Cranford, N.J.      San Francisco<br>201-272-2600      415-982-2323<br>Don Radigan      Tom Marino   |   | <b>IBM 360-40</b><br>Computer time available on all<br>shifts — Minneapolis area.<br>Run DOS or OS<br>384K / 5-2314<br>3-2401-4 / 1403-N1 / 2540<br>From \$35/Hr.<br><b>M-A-P, Inc.</b><br>3440 Winnetka Ave.<br>Minneapolis, MN 55427<br>Contact:<br>Mr. Boyce (612) 545-3200  |                 |
| <b>FOR SALE</b><br><b>BY OWNER</b><br>IBM 3310 model A02 Disk      Qty 2<br>IBM 3310 model B02 Disk      Qty 1<br>For information contact:<br><b>Paul Helen</b><br><b>Bank of America Park</b><br><b>P.O. Box 307</b><br><b>American Fork, Utah 84003</b><br><b>Phone 801-756-7681</b>   | <b>— FOR LEASE —</b><br><b>FLINT, MICHIGAN</b><br>Dry, secure vault stor-<br>age area. 688 sq. ft.<br>Perfect for long term<br>software storage.<br>Call (313) 239-7624   |   | <b>MID-TOWN MANHATTAN SERVICE BUREAU</b><br>Will have shift-plus available on<br>new 4331 system.<br>Effective Nov. 30, 1980.<br>Prime Fifth Ave. Location with<br>office and storage space.<br>Principles only.<br>Write:<br><b>CW Box 2379</b><br><b>375 Cochituate Rd., Rte. 30</b><br><b>Framingham, Mass. 01761</b>  |                 |
|  |   | <b>370/168 mod 3</b><br><b>Datacenter</b><br>All day RJE<br>Specializing in<br>Remote Job Entry<br>TSO, CICS, and Batch<br>IBM 3800 Laser Printer<br>Very Attractive Rates<br>Contact: Stu Karlevsky<br>(212) 564-3030<br><b>Datamor</b><br>132 West 31 St.<br>New York, N.Y. 10001 | <b>ATTENTION</b><br>Doctors — Lawyers<br>Accountants — Sales Agents<br>Computerized Diary System<br>for Sale Source Provided.<br>\$450 per copy.<br>Written in Diebold<br>for PDP-11.<br>Keep your diary<br>on your computer.<br>For details call or write to:<br><b>Gail Washington</b><br><b>Mini-Computer</b><br><b>Systems Technology Inc.</b><br>137 Ferry St.<br>Everett, MA 02149<br><b>617/389-3800</b> |                 |

SOFTWARE FOR SALE

software for sale

software for sale

software for sale

software for sale

software for sale

## DEC/RSTS SYSTEMS DBMS SOFTWARE

ICP MILLION DOLLAR AWARD-WINNING DEC GOLD STAR RATED

**ambase™** A complete application development tool and DBMS, increasing the productivity of programming staffs across the country from 50-90%. Includes:

- DATA MANAGEMENT SYSTEM
- REPORT GENERATOR
- INQUIRY LANGUAGE
- SCREEN FORMAT GENERATOR



**amcor computer corp.**

1980 PLANTSIDE DRIVE • LOUISVILLE, KY 40299 • 502/451-5820  
REGIONAL OFFICES: Atlanta, GA / San Jose, CA

• RPG/RPG II to COBOL  
• COBOL to COBOL  
• FORTRAN to FORTRAN  
• NEAT/3 to COBOL  
• DIBOL to COBOL

Converting is easy with

**DASD**

Proven software  
Experienced personnel  
Nationwide offices  
**CHECK WITH US TODAY**

DASD Corporation  
Corporate Services Center  
Dept. 130/9045 North Deerwood Dr.  
Milwaukee, WI 53223  
(414) 355-3405



## THE TIME SAVERS

RPG to COBOL  
or for those PL/1 Shops  
RPG to PL/1

Two of the many successful translators offered by Dataware provide a smooth and effortless transition from RPG. The translators can handle most any level of RPG (SYS/3, Mod 20, etc.) and achieve an extremely high percentage of automatic conversion (approaching 100%) of the source code.

For more information please call or write today!

The Conversion Software People

**Dataware, Inc.**

2555 Elmwood Ave., Buffalo, NY 14217 (716) 876-8722

TELEX 91519

## How to count your chickens before they hatch.

All you need is a DEC PDP-11 with RSTS and FINAR — the financial analysis and reporting language.

- Budgets
- Project evaluation
- Cash flow
- Forecasts
- Planning
- Consolidation

## FINAR SYSTEMS

132 Nassau St., Suite 212  
New York, NY 10038  
(212) 222-2784



## SYSTEM 34 WORD PROCESSING

Paratext \$250

Full Service Text Editor  
Enter, Edit, Store Text  
Automatic Centering  
Automatic Justification  
3 Print Programs  
Individual Forms Design

Memos  
Contracts  
Documentation  
Sales Brochures  
Business Letters  
Marketing Campaigns

For documentation, call Jeffrey Papows (617) 546-3413  
Para Research, Rockport, MA 01966

## TSO USERS!

THE  
Applied Software  
TSO/SUPERSET-UTILITIES  
IS THE  
BEST ALTERNATIVE  
TO IBM

| Compare:                           | Applied Software's TSO/Superset Utilities | IBM's TSO Data Utilities |
|------------------------------------|---|--------------------------|
| Cost                               | \$130/Installation                        | \$144/CPU                |
| Software Support                   | Class "A"                                 | Class "C"                |
| Full-Screen Support                | Yes                                       | No                       |
| 132 Column CRT Support             | Yes                                       | No                       |
| LISTJES Command (SYSOUT Previewer) | Yes                                       | No                       |
| TSOSORT Command                    | Yes                                       | No                       |
| JTIP Interface                     | Yes                                       | No                       |
| Fast Merge                         | Yes                                       | No                       |

WRITE OR CALL FOR FREE BROCHURE AND TECHNICAL COMPARISON

### Applied Software, Inc.

4440 P.G.A. Boulevard, Suite 204  
Palm Beach Gardens, Florida 33410  
(305) 626-4818

OVER 300 TSO CUSTOMERS WORLDWIDE

## "24 WAYS TO IMPROVE TURNKEY SOFTWARE"

This special new consultant's report covers:

- What is this "thing" called "software"?
- Why is software harder to describe and sell than hardware?
- How to avoid the "classic" pitfalls of turnkey systems management
- Two "standards" that will improve your software development and marketing

To immediately receive your copy of this valuable 5,000 word report plus illustrated brochure on related publications, mail copy of this ad, your business card, and \$3.99 for postage and handling to:

Augur Data Planning Inc.  
1401 W. Broadway,  
Vancouver, B.C., V6H 1H6

ICW/Cat

## SOFTWARE PACKAGES RT-11 & RSX-11M

• Rental • Multiple • On-demand

Limited number of distributions available in prime areas to qualified LSI 11 users

Computer Management Systems

1020 E. FLORIDA  
HEMET, CA 92343  
(714) 952-1207

## SOFTWARE/HARDWARE For

## DATAPoint COMPUTER SYSTEMS

- Accounts Receivable • Accounts Payable • General Ledger • Payroll • Inventory
- Integrated Systems
- On-Line/Interactive
- Written in Datasaurus/Datasaurus #
- Guaranteed Error Free
- No S/W Maintenance Fee
- Source Code/Documentation Included

### Custom Computing, Inc.

P.O. Box 1274 505 Kay St.  
Kilgore, Texas 75822 214-984-0639

TRADEMARK OF DATAPoint CORPORATION

## PL/I for DEC users

The only language you need

PDP-11 and VAX  
RSX-11, IAS, RSTS/E, & VAX/VMS

## Applied information systems

500 Eastowne Drive, Suite 207  
Chapel Hill, NC 27514 Phone: (919) 942-7801

## OMNIDATA

INTERACTIVE data management package for DEC (RT-11) and BASIC/4 systems.

### BERMAN ASSOCIATES

Suite 14, 101 East Holly Ave.  
Sterling, VA 22170  
(703) 450-5000

## CTS-300

### WORD PROCESSING

TEDIT (PLUS) FOR TSO \$975  
ONE TIME CHARGE GETS YOU SOURCE CODE AND ALLOWS UNLIMITED SALES TO YOUR END USERS.

### Sort & File MAINTENANCE UTILITY

(MYSORT) FOR TSO LETS YOU GET A SORT AND FILE MAINTENANCE SYSTEMS UP AND RUNNING IN 60 SECONDS, WITHOUT LEAVING TSO. \$475 ONE TIME CHARGE.

OREGON DIGITAL SYSTEMS INC.  
SOLAR WAY BUILDING, STE 1  
SWEET HOME, OR 97386  
503/367-6881

## SOFTWARE

## WANTED

### WANTED: S/34 SOFTWARE

YOU have a standard package or program.  
WE have the customers in Scandinavia.  
WHY not collaborate?  
DO IT! Contact:

Patrice WORTH  
P.S.W. DATA  
P.L. 1355  
440 06 GRABO SWEDEN

## NEW FOR SYSTEM/34

GENERATE ON-LINE F/M PROGRAMS — ON-LINE ADD/CHG/DEL/INO  
58 FIELDS, REPORT OUTPUT

S/34 DOCUMENTATION AND ANALYSIS AID SYSTEM

OTHER SYSTEMS FOR S/3 AND S/34 — A/P, G/L, A/R, P/R, OTHER

(EXTENSIVE DOCUMENTATION, RPG II SOURCE PROVIDED)

BANCROFT COMPUTER SYSTEMS, INC. (318) 388-2236  
P.O. Box 1533 West Monroe, Louisiana 71291

## SERIES/1 USERS

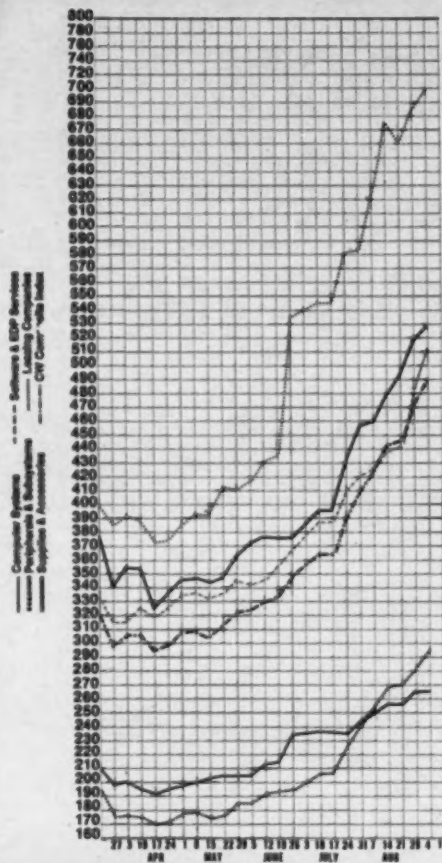
DSI now has available for immediate on sight installation a key-disk software package available on your EDX operating system, utilizing IBM 3101's and/or 4970's.

Custom installation and/or conversion from CMC/PERTEC\* ENTREX/NIXDORF\* FOUR PHASE\* CADE\* INFOREX\* is now available.

Datron Systems Inc.  
940 Springbrook Pkwy.  
Piano, TX 75023  
214/596-2774



## Computerworld Stock Trading Index

COMPUTERWORLD  
THE NEWSLETTER FOR THE COMPUTER COMMUNITY

## CW COMMUNICATIONS/INC.

Board Chairman/Publisher

Patrick J. McGovern

President

W. Walter Boyd

VP-Research Jack Edmonston

VP-Marketing Roy Einreihofner

VP-Editorial E. Drake Lundell, Jr.

VP-Finance William P. Murphy

VP-Circulation Margaret Phelan

VP-Production Lee Vidmer

Computerworld Headquarters

375 Cochituate Road

Framingham, Mass. 01701

Phone: (617) 879-0700

Telex: 95-1153

## SALES

Vice President Roy Einreihofner

Display Adv Mgr Frank Collins

Display Adv Melinda Walker

Jonna Yager

Jenny Charlesworth

Classified Adv Mgr William J. Mills

## RESEARCH

Vice President Jack Edmonston

Market Research Kathryn Dinneen

## CIRCULATION

Vice-President Margaret Phelan

Circulation Mgr Barbara Jeannetti

Service Rep Peggy Kelly

Assistant Carmela Priante

## PRODUCTION

Vice-President Lee Vidmer

Production Mgr Peter Holm

Supervisor Henry Fling

Typesetting Mgr Tom Plau

## Computerworld Sales Offices

**ROY EINREIHOFNER**  
Vice-President/Marketing  
Manager, Display Advertising  
William J. Mills  
Manager, Classified Advertising  
COMPUTERWORLD  
375 Cochituate Road  
Framingham, Mass. 01701  
Phone: (617) 879-0700  
Telex: 95-1153

**BOSTON**  
Robert L. Ziegel  
Northern Regional Director  
Chris Lee  
Edward P. Maracki  
District Managers  
Kathy Doyle  
Susan Wolfe  
Account Coordinators  
COMPUTERWORLD  
375 Cochituate Road  
Framingham, Mass. 01701  
Phone: (617) 879-0700  
Telex: 95-1153

**NEW YORK**  
Donald E. Fagan  
Eastern Regional Director  
Peter Senti  
Michael J. Masters  
District Managers  
Candy Kelly  
Account Executive  
COMPUTERWORLD  
Paramus Plaza 31  
140 Route 17 North  
Paramus, N.J. 07652  
Phone: (201) 967-1350

**CHICAGO**  
Dave Dolber  
District Manager  
Jane Wrightman  
Account Coordinator  
COMPUTERWORLD  
230 North Michigan Avenue  
Chicago, Ill. 60601  
(312) 782-7986

**LOS ANGELES**  
Jim Richardson  
District Manager  
Bob Hubbard  
Account Manager  
Kathie Knox  
Account Coordinator  
COMPUTERWORLD  
3420 Ocean Park Boulevard  
Suite 3020  
Santa Monica, Calif. 90406  
Phone: (213) 450-7181

**SAN FRANCISCO**  
William J. Healey  
Western Regional Director  
Barry G. Milone  
Bob Stinson  
Account Managers  
Ruth Gordon  
Account Coordinator  
COMPUTERWORLD  
353 Sacramento Street  
Suite 600  
San Francisco, Calif. 94111  
Phone: (415) 421-7330

**JAPAN**  
Mr. Shigena Takahashi  
General Manager  
DEMA/COMPUTERWORLD  
1-11-15 Higashi Gotanda  
Shinagawa-ku, Tokyo 141  
Phone: (03) 445-6101  
Telex: J2424481

**UNITED KINGDOM**  
Steve Burton  
IDG PUBLISHING LTD.  
148 Clerkenwell Road  
London EC1  
Phone: (01) 837-1222  
Telex: UK-289477

**Euan C. Rose**  
BEERE, HOBSON ASSOCIATES  
34 Warwickshire Kenilworth  
Warwickshire, CV8 1HE  
Phone: (0246) 578181  
Telex: UK-311951

**WEST GERMANY**  
Eckhard Uppend  
CW PUBLIKATIONEN  
Friedrichstrasse 31  
8000 Munich 40  
Phone: (089) 34-90-81  
Telex: W 01-5-215255-HKFD

**AUSTRALIA**  
Alan Power  
COMPUTERWORLD PTY. LTD.  
37-43 Alexander Street  
Crows Nest, NSW 2065  
Phone: (02) 439-5133  
Telex: SECCO AAZ5488

**BRAZIL**  
Eric Hippesau  
COMPUTERWORLD do BRASIL  
Servicos e Publicacoes Ltda.  
Rua Alcindo Guanabara  
25/10th floor  
20031 Rio de Janeiro, RJ  
Phone: (021) 240-3225  
Telex: 11-32017 (WORD BR)

**MEXICO**  
Kevin Kallaghan  
COMPUTERWORLD de MEXICO  
Dakota 21-2  
Colonia Roma  
Mexico City 7 D.F.  
Phone: (055) 514-5218  
(055) 514-5309

## Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 3, 1980

All statistics compiled,  
computed and formatted  
by  
TRADE QUOTES, INC.  
Cambridge, Mass. 02139

| PRICE                  |                      |  |         |        |        |       |     |                          |                      | PRICE |         |        |        |       |     |   |                       |  |         | PRICE  |        |       |     |  |  |  |         |       |      |      |     |  |  |
|------------------------|----------------------|--|---------|--------|--------|-------|-----|--------------------------|----------------------|-------|---------|--------|--------|-------|-----|---|-----------------------|--|---------|--------|--------|-------|-----|--|--|--|---------|-------|------|------|-----|--|--|
|                        |                      |  | 1979-80 | CLOSE  | WEEK   | WEEK  |     |                          |                      |       | 1979-80 | CLOSE  | WEEK   | WEEK  |     |   |                       |  | 1979-80 | CLOSE  | WEEK   | WEEK  |     |  |  |  | 1979-80 | CLOSE | WEEK | WEEK |     |  |  |
|                        |                      |  | RANGE   | SEP 3  | CHG    | NET   | PCT |                          |                      |       | RANGE   | SEP 3  | CHG    | NET   | PCT |   |                       |  | RANGE   | SEP 3  | CHG    | NET   | PCT |  |  |  | RANGE   | SEP 3 | CHG  | NET  | PCT |  |  |
|                        |                      |  | (1)     | 1980   | CHG    |       |     |                          |                      |       | (1)     | 1980   | CHG    |       |     |   |                       |  | (1)     | 1980   | CHG    |       |     |  |  |  | (1)     | 1980  | CHG  |      |     |  |  |
| COMPUTER SYSTEMS       |                      |  |         |        |        |       |     |                          |                      |       |         |        |        |       |     |   |                       |  |         |        |        |       |     |  |  |  |         |       |      |      |     |  |  |
| A                      | ANDAL CORP           |  | 15-42   | 28 3/8 | +1 7/8 | +7.0  |     | O                        | ADVANCED COMP TECH   |       | 1-4     | 4 1/4  | +1 1/8 | +36.0 |     | A | DATA ACCESS SYSTEMS   |  | 6-17    | 15 3/4 | 0      | 0.0   |     |  |  |  |         |       |      |      |     |  |  |
| N                      | BURROUGHS CORP       |  | 60-88   | 69 7/8 | +2 5/8 | +3.9  |     | O                        | ANACOMP INC          |       | 7-17    | 17 1/8 | +1 1/4 | +7.8  |     | A | DATA PRODUCTS CORP    |  | 11-31   | 29 3/4 | +1     | +3.4  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | COMPUTER AUTOMATION  |  | 40-27   | 27 1/4 | +1 1/4 | +6.8  |     | O                        | ANALYSTS INTEL CORP  |       | 3-8     | 8 3/4  | +1 1/4 | +3.8  |     | O | DATUM INC             |  | 2-4     | 3 3/8  | +1 1/8 | +3.8  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | CONTROL DATA CORP    |  | 38-78   | 75     | +5/8   | +8.8  |     | O                        | APPLIED DATA RES.    |       | 8-21    | 19 7/8 | +1     | +5.3  |     | O | DECISION DATA COMPUT  |  | 2-5     | 4 1/4  | +3/8   | +9.6  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | CRAY RESEARCH INC    |  | 30-70   | 78 1/2 | +8 1/2 | +12.1 |     | N                        | AUTOMATIC DATA PRDC  |       | 31-80   | 49 1/2 | +3 1/2 | +15.5 |     | O | DELTA DATA SYSTEMS    |  | 1-2     | 2 1/4  | +1 1/4 | +76.9 |     |  |  |  |         |       |      |      |     |  |  |
| N                      | DATA GENERAL CORP    |  | 44-87   | 85 7/8 | +1 1/4 | +6.2  |     | O                        | COMPUTER HORIZONS    |       | 1-9     | 9 1/2  | +1/4   | +6.6  |     | N | OCCUPATION INC        |  | 7-27    | 16 3/8 | +1 1/8 | +0.7  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | DATAPoint CORP       |  | 44-80   | 78 1/2 | +1 3/4 | +2.2  |     | O                        | COMPUTER NETWORK     |       | 4-9     | 8      | +7/8   | +12.2 |     | O | DATABARK CORP         |  | 6-37    | 12 1/2 | +1 1/4 | +9.0  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | DIGITAL EQUIPMENT    |  | 52-90   | 89     | +2     | +2.2  |     | N                        | COMPUTER SCIENCES    |       | 11-28   | 27 1/2 | +2 1/8 | +8.5  |     | N | ELECTRONIC M & N      |  | 3-8     | 7 5/8  | +1 1/2 | +7.0  |     |  |  |  |         |       |      |      |     |  |  |
| A                      | EED INC              |  | 6-10    | 17 1/8 | +1/4   | +1.4  |     | O                        | COMPUTER TASK GROUP  |       | 3-13    | 13     | 0      | 0.0   |     | O | EVANS & SUTHERLAND    |  | 21-58   | 22 1/2 | +1/2   | +0.8  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | ELECTRONIC ASSOC.    |  | 6-12    | 12     | 0      | 0.0   |     | O                        | COMPUTER USAGE       |       | 2-7     | 7 1/8  | +2 1/8 | +44.7 |     | O | FABRI-TEK             |  | 1-4     | 3 5/8  | +5/8   | +20.8 |     |  |  |  |         |       |      |      |     |  |  |
| N                      | FOUR-PHASE SYSTEMS   |  | 20-49   | 27 1/4 | +1 1/2 | +1.8  |     | O                        | COMPUT AUTO REP SVC  |       | 4-10    | 7 3/4  | +1 1/4 | +3.6  |     | O | GENERAL COMPUTER SYS  |  | 1-5     | 5 3/4  | 0      | 0.0   |     |  |  |  |         |       |      |      |     |  |  |
| N                      | FOURNO               |  | 31-56   | 49 7/8 | +1 7/8 | +3.9  |     | O                        | COPSHARE             |       | 11-21   | 19 3/4 | +2     | +11.2 |     | O | GENERAL DATA/COMP IND |  | 12-22   | 20 1/4 | 0      | 0.0   |     |  |  |  |         |       |      |      |     |  |  |
| O                      | GENERAL AUTOMATION   |  | 7-19    | 9 7/8  | +1 1/4 | +4.6  |     | O                        | CULLINANE CORP       |       | 3-8     | 8 1/2  | +8     | +18.2 |     | O | GENERAL TERMINAL CP   |  | 1-4     | 2 1/8  | 0      | 0.0   |     |  |  |  |         |       |      |      |     |  |  |
| O                      | GRI COMPUTER CORP    |  | 1-3     | 3 3/8  | +1/4   | +6.0  |     | O                        | DATA DIMENSIONS INC  |       | 1-6     | 1 7/8  | 0      | 0.0   |     | N | HAZELTINE CORP        |  | 12-31   | 27 3/8 | +3/8   | +0.4  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | HEWLETT-PACKARD CO   |  | 44-78   | 72 1/4 | +1/8   | +0.1  |     | O                        | DATATAP              |       | 1-4     | 1 1/8  | 0      | 0.0   |     | N | HARRIS CORP           |  | 25-65   | 42 5/8 | +3/4   | +1.7  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | HONEYWELL INC        |  | 46-101  | 92 1/8 | +3/4   | +0.8  |     | O                        | DSI CORP             |       | 6-36    | 9 7/8  | +1 1/4 | +3.7  |     | O | INFORX INC            |  | 1-8     | 1 1/2  | +1     | +4.9  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | IBM                  |  | 50-79   | 67 1/2 | +1 5/8 | +2.4  |     | O                        | ELECTRONIC DATA SYST |       | 19-32   | 31 3/4 | +3/4   | +1.1  |     | O | INFORMATION INTEL INC |  | 8-15    | 14     | +1 1/4 | +9.8  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | MAGNUSON COMP SYSTS  |  | 20-35   | 35     | +3/4   | +12.0 |     | O                        | INFORMATICS INC      |       | 9-25    | 24 3/4 | +4     | +19.2 |     | O | INTEL CORP            |  | 49-93   | 91 1/2 | +2 3/4 | +3.0  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | MANAGER-PAT ASSIST   |  | 9-24    | 23     | +1/2   | +2.2  |     | O                        | INSYTE CORP          |       | 1-3     | 2      | 0      | 0.0   |     | O | INTERFIL              |  | 13-39   | 36 3/8 | +1 1/4 | +4.9  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | MANUFACTURING DATA S |  | 27-48   | 46 1/2 | +2 3/4 | +6.2  |     | O                        | IPS COMPUTER MARKET  |       | 2-4     | 2 3/4  | 0      | 0.0   |     |   |                       |  |         |        |        |       |     |  |  |  |         |       |      |      |     |  |  |
| O                      | MINI-COMPUTER SYST   |  | 2-6     | 4 3/4  | 0      | 0.0   |     | O                        | KEANE ASSOCIATES     |       | 3-9     | 6 1/2  | +1 1/2 | +8.3  |     | A | LUNOY ELECTRONICS     |  | 4-12    | 10     | +1/2   | +4.7  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | MODULAR COMPUTER SYS |  | 9-24    | 24 1/2 | +2 1/2 | +11.3 |     | O                        | KEYDATA CORP         |       | 3-5     | 3 1/8  | +1/8   | +5.5  |     | N | RENDER                |  | 10-34   | 16 7/8 | +1 3/8 | +7.1  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | NCR                  |  | 92-82   | 72     | +1 1/2 | +2.1  |     | A                        | LOGICON              |       | 12-26   | 24 1/2 | +1 1/2 | +2.0  |     | N | ROMARK DATA SCI       |  | 10-27   | 27 1/4 | +2 3/4 | +11.2 |     |  |  |  |         |       |      |      |     |  |  |
| N                      | PRIME COMPUTER INC   |  | 13-30   | 30     | +1 1/2 | +6.0  |     | O                        | MATHEMATICA INC      |       | 9-18    | 18     | +2     | +12.5 |     | O | OMER                  |  | 2-10    | 6 1/2  | 0      | 0.0   |     |  |  |  |         |       |      |      |     |  |  |
| N                      | PERKIN-ELMER         |  | 28-60   | 59 1/2 | +3/8   | +0.6  |     | O                        | NATIONAL DATA CORP   |       | 10-22   | 21 3/8 | 0      | 0.0   |     | A | PARADYNE CORP         |  | 18-43   | 41 1/4 | +7/8   | +2.1  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | SPIRIT CORP          |  | 42-60   | 54 5/8 | +3/8   | +0.6  |     | N                        | PLANNING RESEARCH    |       | 9-9     | 7 3/8  | +1/4   | +3.3  |     | A | PERMIL CORP           |  | 9-15    | 12     | +1/8   | +1.0  |     |  |  |  |         |       |      |      |     |  |  |
| A                      | SYSTEMS ENG. LABS    |  | 11-33   | 32 1/2 | +1/8   | +0.3  |     | O                        | PROGRAMMING & SYS    |       | 3-1     | 3 1/4  | +1     | +7.7  |     | O | REMARKS CORP          |  | 10-14   | 16 3/4 | +1 1/2 | +11.3 |     |  |  |  |         |       |      |      |     |  |  |
| O                      | TANDEN COMPUTERS INC |  | 13-48   | 46 1/4 | +1 1/2 | +1.0  |     | O                        | RAPIDATA INC         |       | 4-9     | 8 3/4  | +5/8   | +5.6  |     | O | RECOGNITION EQUIP     |  | 5-18    | 15 3/4 | 0      | 0.0   |     |  |  |  |         |       |      |      |     |  |  |
| N                      | TEXAS INSTRUMENTS    |  | 70-127  | 125    | +1/4   | +0.1  |     | O                        | REYNOLDS & REYNOLD   |       | 21-34   | 22     | +1     | +4.7  |     | O | SCAN DATA             |  | 1-5     | 3 1/4  | +3/4   | +12.7 |     |  |  |  |         |       |      |      |     |  |  |
| A                      | WANG LABS.           |  | 71-52   | 51 5/8 | +3 5/8 | +7.5  |     | O                        | STSC INC             |       | 6-14    | 13 3/4 | +1 1/2 | +12.2 |     | N | STORAGE TECHNOLOGY    |  | 12-22   | 19 7/8 | +1/2   | +2.4  |     |  |  |  |         |       |      |      |     |  |  |
| LEASING COMPANIES      |                      |  |         |        |        |       |     |                          |                      |       |         |        |        |       |     |   |                       |  |         |        |        |       |     |  |  |  |         |       |      |      |     |  |  |
| O                      | ROOTHE FINANCIAL CP  |  | 13-20   | 38 1/4 | 0      | 0.0   |     | O                        | SCIENTIFIC COMPUTERS |       | 4-10    | 10 3/4 | +3/4   | +5.4  |     | O | T RAC INC             |  | 3-21    | 17 1/4 | +1 1/4 | +1.6  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | COMDISCO INC         |  | 8-17    | 16     | +1     | +6.6  |     | N                        | TYMSHARE INC         |       | 5-15    | 13 1/2 | +7/8   | +0.9  |     | N | TEKTRONIX INC         |  | 42-70   | 67 1/2 | +1 1/4 | +1.6  |     |  |  |  |         |       |      |      |     |  |  |
| A                      | COMPASS GROUP CORP   |  | 1-2     | 2 1/8  | 0      | 0.0   |     | N                        | URS SYSTEMS          |       | 4-10    | 17 3/4 | +3 3/4 | +26.7 |     | N | TELETYPE SYSTEMS CP   |  | 7-27    | 26     | +1 1/4 | +1.8  |     |  |  |  |         |       |      |      |     |  |  |
| A                      | COMPUTER INVESTS GRP |  | 2-4     | 1 5/8  | 0      | 0.0   |     | N                        | WVLY CORP            |       |         |        |        |       |     | O | WILTER INC            |  | 1-9     | 2 5/8  | +1/8   | +4.5  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | CONTINENTAL INFO SYS |  | 2-14    | 4 1/4  | +1/4   | +6.2  |     | PERIPHERALS & SUBSYSTEMS |                      |       |         |        |        |       |     |   |                       |  |         |        |        |       |     |  |  |  |         |       |      |      |     |  |  |
| N                      | DATACRUISE RENTAL    |  | 2-4     | 3 1/4  | +1/4   | +6.3  |     | N                        | AN INTERNATIONAL     |       | 13-22   | 21 3/8 | +3/4   | +3.5  |     | A | AMERICAN BUS PHOS     |  | 6-14    | 12 7/8 | +1/2   | +3.7  |     |  |  |  |         |       |      |      |     |  |  |
| A                      | DEL INC              |  | 9-4     | 3 1/4  | 0      | 0.0   |     | A                        | ANDERSON JACOBSON    |       | 9-17    | 17     | +7/8   | +5.4  |     | O | BALTIMORE BUS FORMS   |  | 1-2     | 3/4    | 0      | 0.0   |     |  |  |  |         |       |      |      |     |  |  |
| N                      | DFP INC              |  | 18-12   | 8 1/8  | +3/8   | +4.4  |     | N                        | APPLIED DIG DATA SYS |       | 9-12    | 11 3/4 | 0      | 0.0   |     | O | BELMONT BUS           |  | 11-19   | 14 1/2 | +5/8   | +1.1  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | OFF INC              |  | 9-12    | 8 1/8  | +3/8   | +4.4  |     | O                        | AUTO-TRIL TECHNOLOGY |       | 18-40   | 17 1/2 | +3/4   | +1.2  |     | O | DUPLEX PRODUCTS INC   |  | 11-30   | 14 1/4 | 0      | 0.0   |     |  |  |  |         |       |      |      |     |  |  |
| N                      | TEL                  |  | 1-15    | 2 1/2  | +1/4   | +11.1 |     | O                        | BENTON INTEL         |       | 3-14    | 13     | +1/2   | +6.2  |     | N | FPM BUS, FORMS        |  | 13-21   | 17     | +1/4   | +0.4  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | LEASPCAP CORP        |  | 2-3     | 2 3/4  | 0      | 0.0   |     | A                        | BOLT-RENNER & NEW    |       | 12-29   | 27 1/2 | +5/8   | +2.8  |     | A | FRMS 3RD COMPANY      |  | 46-60   | 59     | +3/8   | +0.6  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | PRINTER TEX CORP     |  | 4-5     | 4 3/4  | +1/2   | +12.1 |     | N                        | BUNNER-WAND          |       | 17-34   | 34     | 0      | 0.0   |     | N | HOME BUS LTD          |  | 3-7     | 36 3/8 | +3/4   | +1.4  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | RELIANCE GROUP INC   |  | 24-73   | 71 5/8 | +1     | +4.4  |     | O                        | CENTRONICS RESOURCES |       | 20-59   | 59 3/4 | +7/4   | +2.3  |     | N | IBM AS/400            |  | 37-59   | 58 1/2 | +1 1/4 | +4.8  |     |  |  |  |         |       |      |      |     |  |  |
| N                      | U.S. LEASING         |  | 12-20   | 19 7/8 | +1 1/4 | +6.7  |     | A                        | CETEC CORP           |       | 3-7     | 6 1/4  | +1/8   | +1.9  |     | N | NASHA CORP            |  | 37-59   | 58 1/2 | +1 1/4 | +4.8  |     |  |  |  |         |       |      |      |     |  |  |
| SUPPLIES & ACCESSORIES |                      |  |         |        |        |       |     |                          |                      |       |         |        |        |       |     |   |                       |  |         |        |        |       |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | STANDARD REGISTER     |  | 11-25   | 35 3/8 | +3/4   | +3.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | N | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  |     |  |  |  |         |       |      |      |     |  |  |
| O                      | COMPUTER DEVICES INC |  | 5-4     | 4 1/2  | +1     | +13.3 |     | O                        | COMPUTER DEVICES INC |       | 5-4     | 4 1/2  | +1     | +13.3 |     | O | WALLACE BUS FORMS     |  | 23-34   | 37 1/4 | +1/4   | +0.0  | </  |  |  |  |         |       |      |      |     |  |  |

# On Sept. 30, 1980 Isaac Asimov Will Keynote The Most Unique Future-Focus Seminar You've Ever Had The Chance To Attend.

This is the hard-hitting information about the present and future state of the data processing and communications industry presented by the "source" — the people who, along with a handful of others, actually shape the future direction of this business. The program has been designed to assure you the opportunity to meet and exchange ideas with these industry leaders and other attendees in a smaller and more productive environment.

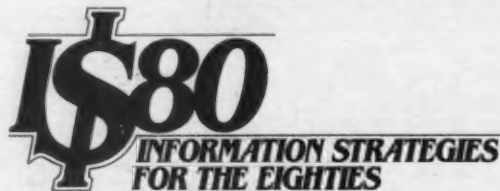
IS-80 is not an exposition where you're fed a lot of irrelevant information on a paper plate. Instead, IS-80's smaller and more personal format will be like getting the key to your organization's successful future — on a silver platter.

Topics and issues that are the real concerns — the insights and projections that you really need to know about, will be presented by an unprecedented roster of speakers.

As we explained, in order to keep this meeting personal and for the optimum exchange of ideas, attendance *will be limited*. So don't hesitate. Outside of Connecticut call Connie Galley, toll-free at 1-800-243-5060.

#### The Roster of Speakers Includes:

Dr. Isaac Asimov, noted author and futurist  
*Yesterday's Science Fiction is Today's Reality . . . and Tomorrow?*  
Dave Davison, President, Zytron Corp.  
*The Office of the Future: The Tools*  
Charles Lecht, President, ACT, Inc.  
*The Collision of the Computer and Communications Industries: Who will win?*  
Gideon Gartner, President, Gartner Group, Inc.  
*The Computer Business: A View From Wall Street*  
Harvey Poppel, Sr. V.P., Booz, Allen & Hamilton, Inc.  
*Office Automation: The Winners & Losers*  
John DeAno, President, ASI, Inc.  
*Motivation: Helping Employees View Change as an Opportunity, and Not as a Threat*  
Dr. Lawrence Roberts, President, GTE Telenet  
*Communication Networks: The Information Link*  
Peter Cunningham, President, INPUT  
*Putting It All Together: Hardware, Productivity, People & Management*  
Lawrence Welke, President, ICP, Inc.  
*Computer Software: The Heart of the Computer*



September 30 - October 2, 1980

Stouffer's Inn of Westchester, New York

The registration fee of \$965 for 3 days includes all meals and activities; lodging is not included.

IS-80 is sponsored by the Software Products Division of National CSS, a company of The Dun & Bradstreet Corporation, 50 Washington Street, Norwalk, Connecticut 06854, 203-853-2884.

